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ABSTRACT

Six papers and two abstracts of papers are presented from the 1995 CAUSE conference track on user services issues faced by managers of information technology at colleges and universities. The papers include: (1) "Academic Computing Services: MORE than a Utility" (Scott Bierman and Cathy Smith), which focuses on Carleton College's efforts to serve the computer needs of faculty; (2) "ACT--Get Your ACT Together" (Dennis L. Kramer and others), which discusses Ball State University's Adaptive Computer Program for faculty and students with disabilities; (3) "Back to the Future--A Management Perspective on Distributed Support" (Andrea Martin and Vicky Dean), on decentralized computer support services at Rice University; (4) "Collaborating for the More Effective Integration and Use of Technology" (Kenneth E. Pflueger), which discusses technology utilization at California Lutheran University; (5) "The Risks of Success: Sustaining and Supporting Mainstream Use of Instructional Technology" (William H. Geoghegan and others), an abstract of a paper on computer support services for mainstream, non-technologically-inclined faculty; (6) "The Leveraged Support Model--How to Support Work in a Distributed Computing Environment" (Dianne Jung-Gribble and others), an abstract of a paper on computer support models; (7) "Information Technology Planning: Letting the Users Take Over a Federated Framework for Information Technology Planning" (Paul B. Gandel and Raymond F. von Dran), on the role of the Information Resources Council at the University of North Texas; and (8) "(E)merging Environments and Professionals: The University Center as Catalyst for GMU's Vision" (Walter W. Sevon, Jr., and others), which details technology infrastructure planning at George Mason University. Some papers contain references. (MDM)

ED 392 338

TRACK 4
RETHINKING USER SERVICES

Coordinator: Mary E. McClure

Realizing the Potential of Information Resources:
Information, Technology, and Services

Proceedings of the 1995 CAUSE Annual Conference

HE 028 926

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Academic Computing Services: MORE than a Utility

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Abstract

The year 1993 saw the birth of a totally new academic computing service organization, and faculty support model, for Carleton College. The result of a campuswide faculty demand for support of information technology use in the curriculum, the model's key elements are: technical support staff with substantial backgrounds and abilities in the disciplines of the faculty with whom they work; faculty "advisors" who partner with the technology staff in supporting faculty technology use; redefinition of "academic computing" as a campuswide, collaborative endeavor; satisfaction of faculty needs as the main arbiter of (a) what support is available, and (b) whether "success" is achieved.

The Carleton experience is consistent with, and validation for, the "quality movement" under way in higher education. "Putting the customer first" has proven an unerring guide in the design of excellent faculty technology support. This experience at the same time is contrary to the current trend toward central technology groups as "utility companies." Carleton has demonstrated that services of a profoundly "value added" nature are eminently and effectively doable by a central computing organization.

Academic Computing Services: MORE than a Utility

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Carleton College

In 1993 a totally new academic computing service organization began operation at Carleton College. An earlier organization had proved not to be well suited to keeping pace with campus-wide faculty demand for support of information technology use, particularly in the curriculum. The essence of the approach of the new organization derives from a redefinition of "academic computing" as a campus-wide, collaborative endeavor in which satisfaction of faculty needs is the main arbiter of what support is available and whether "success" is achieved. This emphasis stems from an understanding that the primary mission of the College is to provide the best education to students that financial resources allow.

Prior to 1993 faculty technology support at Carleton – like that at many colleges and universities – was based on the twin pillars of technology standards and the help desk. Implicit in such an approach is the premise that limiting the number and range of available technologies and the activities of support staff is the best, if not only, way to provide technology support. As Carleton faculty increasingly attempted to integrate technology use into their teaching and research, they found this model to be an inadequate match for their needs which were typically discipline-specific and experimental in nature.

In the past two years a new customer-centered support model has been implemented. The model's underlying premise is that embrace of the full diversity of discipline-based needs and tools and establishment of highly personalized and time-intensive relationships between faculty and support staff will profoundly alter the frequency, quality and impact of information technologies use in teaching and research. The fundamental task of the academic computing organization is to understand what it is that faculty would like to accomplish and then to work with the faculty to select and implement the appropriate information technologies that will increase their effectiveness. This requires that substantial academic computing staff time be devoted to understanding the objectives of individual faculty. Since the ebb and flow of dialogue between faculty and academic computing staff is the central characteristic of this model the organizational structure is designed to facilitate communication.

What two years of data have shown is that the new model has proven an unerring guide in the design of excellent faculty technology support. This experience is highly consistent with, and validation for, the "quality movement" in higher education. The Carleton experience is at the same time contrary to the recent trend toward central technology groups as "utility companies". We have demonstrated, in a remarkably short time, that services with tremendous value-added are eminently and effectively doable by a central computing organization.

I. Faculty Technology Use: Then vs. Now

The profile of faculty technology use after two years of the new support model is vastly different than before: skill levels are higher; overall use levels are higher; curricular use is higher.

Skill and Use Levels

	None	Limited	Moderate	High
Personal Computer				
Skills				
1995	0%	7%	60%	32%
1993	4%	61%	27%	8%
Use				
1995	0%	6%	38%	56%
1993	4%	43%	36%	16%
Word Processing				
Skills				
1995	2%	4%	62%	32%
1993	4%	44%	36%	15%
Use				
1995	1%	5%	44%	49%
1993	2%	37%	35%	26%
E-Mail				
Skills				
1995	2%	15%	54%	29%
1993	49%	38%	10%	3%
Use				
1995	2%	13%	44%	41%
1993	48%	34%	12%	6%
Internet				
Skills				
1995	18%	35%	27%	21%
1993	90%	6%	2%	1%
Use				
1995	17%	34%	27%	22%
1993	91%	6%	2%	1%

Curricular Use

Prior to 1993, curricular uses of information technologies – i.e., uses by students in classes in support of specific curricular outcomes – was rare outside of the sciences and mathematics. Since 1993, curricular computing use has burgeoned within the humanities and social sciences: The percentage of faculty making moderate-to-high use of technology in teaching has quadrupled, **from 6% to 24%**. The percentage using technology in teaching at any level has more than doubled**, from 16% to 34%**.

The following vignettes are representative of the range, nature and scope of technology-based curricular enhancements facilitated campus-wide by the new faculty support model.

- Economics: Students are completing senior thesis projects easily equivalent of masters theses. Original research questions are being explored through analysis of vast data sets.
- English: Students are conducting extensive and complex literary analyses through use of electronic texts and sophisticated search engines.
- Biology: Students in several mid-level courses are able for the first time to analyze – not just describe – images from light and electronic microscopes through use of image capture and analysis equipment.

Overall, **one/fifth** of the Carleton faculty have participated in the 2.5 year old "Curricular Computing Grant Program" (more on this program below).

What is most important to see is the change in the overall willingness to experiment with new curricular innovations that use information technologies. The understanding by Carleton faculty that there is help around the corner from technical support staff makes a vast difference in a faculty member's willingness to undertake risky curricular changes. - Scott Bierman

We could have cited "numbers of things" data here, e.g., numbers of computers, numbers of network nodes, numbers of dollars in technology budgets, etc. Such data for Carleton would indeed suggest an "improved faculty technology environment". They, however, would say nothing about increases in faculty abilities and as such would have little point. - Cathy Smith

II. How We Got Here: The Process of Changing the Nature of Faculty Technology Support

The Faculty Task Force on Academic Computing (1992)
In January of 1992 the Dean of Budget and Planning and the Dean of the College called on a group of five faculty, one student, and two administrators to consider computing in the classroom and laboratory, computing in faculty and student research, and computing in academic departments and support services. It was suggested that organizational recommendations would be welcome.

The Challenge: It was understood by all that the College must provide the staff and equipment to make effective use of the opportunities available to enhance the traditional objectives of the College through the use of information technologies. Having said the obvious, the real issue was what organizational structures could be put into place that would increase the likelihood of curricular computing initiatives being employed effectively at Carleton.

It seemed to the task force that the key to getting curricular computing off the ground was to have a structure designed to facilitate communication between faculty and academic computing staff. If faculty could communicate clearly to academic computing staff what their objectives were in their classes, and if academic computing staff could clearly communicate to faculty how information technologies could be used to achieve those goals, curricular computing initiatives would stand a chance. As the task force wrote: *A close knit partnership between faculty members and members of the academic computer staff must be nurtured and encouraged. Effective lines of communication must be developed between everyone interested in academic*

computing. All parties must learn how to utilize the specific strengths that each brings to their joint ventures.[1]

The Vision: The emphasis from the task force, therefore, was the establishment of a true partnership between faculty and academic computing staff in which the creation of a curricular computing initiative would come about through a dialogue between the two. This dialogue would require that the academic computing staff have good information regarding the objectives and skills of individual faculty members. Obviously, this dialogue would rarely occur as long as the academic computing organization was a standards based, lowest-common-denominator model. Instead the task force proposed a model whose principal features included: (1) cluster departments into divisions based on discipline similarities; (2) provide one professional technology support staff for each division; (3) expect that the technology support staff, including a new director, have division-applicable background in teaching and research as well as technical skills; and (4) identify one faculty member from each division to provide peer and pedagogical support to other faculty.

The task force identified absolutely the right model of faculty support. We thank them for their wisdom! — Cathy Smith

Designing the New Academic Computing Cooperative (January - June 1993)

Planning: Cathy joined Carleton as the new "academic computing director" in January of 1993. Over the following six months, a participatory and collaborative process involving groups of faculty, academic staff and students, and all computing staff, was utilized to define what the new academic information technologies organization would be and do. Within two months, the "Initial Planning Document for Academic Computing" was published. It articulated a vision and mission, and the goals and initiatives for the new academic computing endeavor. The specific goals regarding faculty use of information technologies were:[2]

- Empower faculty to acquire and effectively use information technology for both curricular and scholarly purposes.
- Stimulate innovation in the use of information technology in classroom- and laboratory-based instruction and learning and promote the use of information technology to support the development of new paradigms for teaching and learning.

Staffing and Budget: Based on the Planning Document, staffing and budget requests were developed and submitted. In line with original Task Force recommendations, the staffing request included three staff to serve as the Academic Computing Coordinators for the divisions into which academic departments would be grouped.[3] The staffing request also included 50 hours per week of student work for each Coordinator. A financial model for academic information

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[1] "Report of the Task Force for Academic Computing", May 19, 1992, p. 2.

[2] "Initial Planning Document for Academic Computing", April, 1993, pp. 5, 9.

[3] The full staffing request, in number of FTE, was: Academic Computing Coordinators, 3; Systems/Network staff, 2; Student Computing Coordinator, 1; Information Coordinator, 1; Director, 1; Clerical/Administrative support, .33. In 1995, a third FTE was added in Systems/Networks. The three Systems/Network staff support *all* central computers and networks, academic and administrative. One hardware maintenance technician in the administrative computing organization similarly services the entire college.

technologies was developed, and formed the basis for the requested operating budget. A key feature of the financial model was the life-cycle replacement of computer and networking hardware and software. The importance to aggressive and effective faculty technology use of a budget capable of supporting both regular equipment replacement and modest but steady growth in equipment inventories can not be overestimated.

The resulting staff allocation included staff from the previous single campus computing group, and one new FTE. The budget allocation was a combination of an adequate base for year one plus a commitment to build the base over a multi-year period to the levels of the financial model.

Clustering Departments Into Divisions: Cathy, the staff who were to become two of the three faculty Computing Coordinators, and the Advisory Committee for Academic Computing (the committee is described below) spent the Spring of 1993 discussing how the general faculty support model articulated by the Task Force would in actuality operate. First, the three divisions of academic departments were defined. Defining criteria were discipline, curricular and technology use affinities, plus the goal of a reasonably even distribution of clients:

Social Sciences, Performance Arts, & Physical Education	**Languages & Humanities**	**Natural Sciences, Mathematics & Art**
African/African-American Studies	Academic Development & Support Center	Arboretum
Asian Studies	American Studies	Art & Art History
Economics	Asian Languages & Literatures	Biology
Educational Studies	Classics	Chemistry
Learning & Teaching Center	English	Geology
Music	German & Russian	Linguistics
Music & Drama Center	History	Mathematics & Computer Science[4]
Physical Education	Judaic Studies	Physics & Astronomy[5]
Political Science	Media Services	Psychology
Sociology & Anthropology	Media Studies	Dean for Budget & Planning[5]
Studies in Theater Arts	Modern Language Center	
Women's Studies	Religion	
	Romance Languages & Literatures	

Defining Support Services: Then, "every conceivable" support activity and variation on it was analyzed by the group: What benefit did each provide, and how critical was this? What level of the Computing Coordinators' time and effort did each require, and did the "payoff" warrant it? This dialog, by clearly identifying the costs and benefits of all possible support functions, generated a highly realistic set of support services priorities. Three support priorities emerged from this process:

- The ability of Computing Coordinators to spend large amounts of time interacting with individual faculty and exploring technologies on faculty's behalf

[4] It should be noted that these two departments each hired one computer support staff some years ago. The Coordinator for the division is nonetheless very active with these departments; the bulk of faculty assistance it met by the departmental support person, however.

[5] This obviously administrative department is supported by academic computing because it is the office to which academic computing reports.

- The ability of Computing Coordinators to assist individual faculty with the development and delivery of computing and networking uses in the classroom
- Faculty freedom to choose, and be supported in using, a wide range of software

In light of these priorities, examples of service tradeoffs were:
The Coordinators would often be away from their phones. Faculty expressed a strong desire to be able to interact with professional rather than student computing staff. Conclusion: A "help desk" – where someone is guaranteed to be available to answer telephones during defined business hours – would not be among the set of faculty support services. Resulting service profile: Someone will not always answer the phone, but when the phone is answered, resolution is basically guaranteed.

Formal computer training curricula and good computer documentation require very large amounts of time and effort. Could the Computing Coordinators develop and maintain a curriculum and local documentation *and* meet the three service priorities? *No.* Conclusion: Neither a formal computer training curriculum nor a program of local documentation would be among the set of faculty support services. Resulting service profile: Faculty receive individualized "training" upon request. Interactions with Coordinators are the vehicle for much, if not most, learning. Vendor manuals are distributed with all equipment and software, and Coordinators make it a practice to engage faculty with their manuals in consulting situations.

III. The New Academic Computing Cooperative in Action (July 1993 - PRESENT)

The Academic Computing Coordinators

The three Computing Coordinators have the combination of technical and discipline-specific backgrounds defined as ideal during the planning process. One is a Classicist and language specialist; the second, a Political Scientist and quantitative methods specialist; the third, a Physicist, specializing in numerical and laboratory techniques. Our experience has confirmed that, in order for the Computing Coordinators to partner with and support their faculty in the ways and extent envisioned by our model, it is absolutely imperative that they have academic backgrounds, and remain actively engaged in the issues of teaching, learning and research.

Such a staffing approach can present challenges. For instance, these individuals can be hard to find. It can not be assumed that individuals who have been successful in traditional faculty technology support roles will do well in our non-traditional model. Where, then, does one look? We have successfully recruited two Computing Coordinators from the growing ranks of graduate students in love with the possibilities of technology in teaching and research as well as their academic disciplines. The recruitments have taken longer than those of more traditional staff, and have required a high level of active searching and soliciting.

Though the Coordinators are characterized as technical support staff, if required we will sacrifice technical skills to academic ones during recruitment. Whereas an individual can build technical skills over time – and while they do, other staff in the organization can help out – s/he cannot undertake, or redo, an entire career as a student, graduate student, teacher and researcher.

How Academic Computing Coordinators Interact with Faculty

Computer Delivery and Set Up: A Key "Bonding" Experience: The Coordinators and their student assistants set up the computers of their clients. After installing and testing hardware and software in our "bench" area, they then install the system including network connection in the faculty office or lab. At that time or others of faculty choosing, they also provide one-on-one training on the use of the system and application software.

Software "Standards": This seems like a good point to talk about the issue of "software standards". Within budget constraints, the choice of applications software installed on a system is the user's. What this has meant in practice is:

- Word processing, spreadsheet, file management, presentation, graphics – The range of what faculty currently want and need includes approximately six word processing, three file management, three spreadsheet, two presentation, and three graphics programs.
- Faculty require a large variety of discipline-specific applications. We have successfully met these needs by the process through which departments and academic computing collaboratively determine the computing equipment needed within the department through yearly analysis and planning, and by the establishment of key site licenses.

We acquire and provide assistance with the range of applications needed and used by faculty. Our support philosophy is that simple.

Moving from the prior software standards-based environment to an approach that focuses on what it is that faculty need to be able to do has resulted *not* in chaos and pandemonium, *but rather* in faculty having the applications they need and with which they feel comfortable and will achieve new outcomes in their teaching and research.

"Computer Delivery" is therefore a very pivotal occasion for faculty and computing staff to establish what will be an ongoing relationship of highly personal and individualized support. Because the software and hardware being installed has been selected on the basis of faculty needs and preferences, installation is a time of mutual excitement and anticipation, a time when faculty and computing staff begin to explore possibilities together.

Training: The Computing Coordinators and their assistants provide one-on-one training to faculty upon request. The request is often the result of a Coordinator suggestion that s/he could show/teach a particular topic or skill. Training content and scheduling is determined by client need; the training usually occurs in the faculty office, on the faculty computer. Small group training has also been utilized for networking topics as networking initiatives usually occur at the department level.

Curricular and Technology Research: The question we particularly hope for from faculty is of the form, "Is it possible to....". We earnestly want faculty to express any/all ideas on possibilities for curricular enhancement. Such ideas do not necessarily contain a technology component at the outset. The ideas do provide a basis for discussions between faculty and their Computing Coordinators (and their Faculty Advisors as detailed below). The ideas are poked, prodded, expanded, and clarified. Based on the discussions, the Coordinators may conduct research in a myriad of areas – e.g., what is being done in like courses at other institutions, what

technologies may particularly support the curricular goals – through a myriad of resources – e.g., Internet resources, cohorts at other institutions, periodicals, technology vendors, etc. The process is then an iterative one of refinement through successive discussions and information gathering, typically including the hands-on examination of software an/or hardware. When the research process concludes, an idea is sorted into one of a few categories: non-starter; infeasible at this time; great idea; let's pilot it.

Curricular and Technology Pilots: A pilot is an experiment: Will the desired curricular enhancement materialize through the introduction of technology use and other changes within a syllabus, and at what costs? Pilots involve at least introductory mastery of a technology by the instructor and some student use as part of their course work. The Computing Coordinator's role is to provide full and direct assistance at every step; faculty training, software and hardware preparation and testing in our student computing environment, student training, and trouble shooting and analysis. (Successful pilots are then systematically integrated into departmental curricula, the student computing environment, and the academic computing budget.)

It is very important for faculty to have frequent contact with the Coordinator. It is rare that a conversation I have with my Coordinator begins with "Is it possible to...", more often it consists of some seemingly mundane problem that I am trying to jury-rig a solution to. From there my Coordinator will ask me what I am trying to accomplish and twenty minutes later we are embarking on a far more ambitious and intelligent plan of action. Because of the value of these conversations I have made it a point to call on my Coordinator at least once a month whether I need her help or not. While these are intended to be social calls they invariably turn out to be extremely productive as well. - Scott Bierman

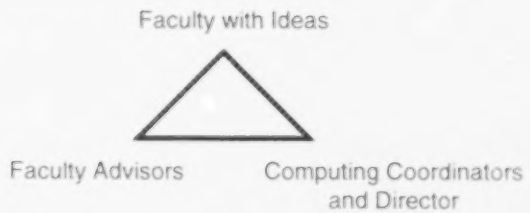
The Relationship Between Academic Computing Coordinators (ACC) and Other Academic Computing Staff

Student Assistants: Each Computing Coordinator recruits, trains and supervises 3-5 student assistants. Assistants perform the functions and tasks delegated to them by the Coordinators.
Student Computing Coordinator (SCC): The SCC Manages student computing sites. The SCC is solely responsible for generic and general purpose offerings of student sites; the ACCs share responsibility for course- and discipline-specific offerings. The SCC manages and maintains computer classroom facilities; the ACCs train faculty in use of computer classrooms, participate in first classroom session(s), and remain on-call to provide faculty assistance thereafter.
Systems/Network Staff: Systems staff manage central computing resources; ACCs perform account and volume management for their users. Network staff design, manage and maintain network cabling and electronics up to the wall jack; ACCs install network cards in faculty computers, and connect to the wall jack. Network staff select and define standard configurations for network software; ACCs install and support network software on faculty computers.
Information Coordinator (IC): The IC develops local timesharing system documentation for students; the ACCs also distribute this documentation to faculty. The IC manages the campus WWW server and academic computing's web content; the ACCs and assistants develop and maintain academic department home pages. The IC sits on CWIS oversight committee; one ACC also sits on CWIS committee.

Desktop Hardware Maintenance: ACCs attempt to diagnose hardware problems, and effect those repairs which consist of replacing parts. Diagnoses and repairs beyond this are passed to the campus hardware technician (see footnote 3).

Faculty Advisors

There are three "Faculty Advisors for Information Technology" at any time. A Faculty Advisor is intended to be an advocate and counselor for other faculty wishing to make further use of information technologies in their teaching. A Faculty Advisor is not a "technology super person", but rather someone who is comfortable with technology, uses technology in the classroom, and is willing and enthusiastic about talking with cohorts regarding the costs, benefits, and pedagogical issues of curricular computing. One member of the faculty from each division is invited to take on this role. The commitment is a three year one, and a 1/6 course release per year is offered as remuneration. The Director and Computing Coordinators work in close collaboration with the Faculty Advisors. Faculty Advisors are involved in the curricular discussions, research and piloting discussed above:



Curricular Computing Grant Program

The establishment of a competitive faculty grant program was among the very earliest objectives cast for the new academic computing organization. The program was launched in the spring of 1994 with the simple goal: *Curricular Computing Grants are designed to enable faculty to explore, experiment with, and pilot the use of information technologies to enhance their teaching. The goal is the improvement of educational outcomes.*[6]
Possible awards include stipends for times when the College is not in session, software, hardware, fees for training, data, etc., and in exceptional cases, course release. Grants have been awarded to 35 faculty in three years; this represents (an amazing) 20% faculty participation rate.[7]

This program has been the vehicle through which most of the curricular computing ideas, discussions, pilots and adoptions have occurred. It is therefore the coalescence point of the goals of the new computing organization, the role of the Computing Coordinators, and the role of the Faculty Advisors.

The program has provided us with a comprehensive, consistent and ongoing means of curricular innovation. It is not clear that we would have accomplished so much, so quickly, without it.
- Cathy Smith

[6] "Curricular Computing Grants: Guidelines for Proposals", revised September, 1995, p. 1.
[7] Check http://www.carleton.edu/campus/ACNS/CAUSE/cause3.html for a list of the Curricular Computing grants

As much as anything the Curricular Grant Program has provided an institutional stamp of approval for faculty to spend time on curricular initiatives. Now, finally, was a recognition that it is time consuming to modify curricula to take advantage of information technologies and that the time spent doing so is valued by the College. - Scott Bierman

Advisory Committee for Academic Computing

The Advisory Committee for Academic Computing is made up of the academic computing director, the Faculty Advisors, an Associate Dean, one staff member from an important academic support unit, and one student.[8] The Chair of the committee is one of the Faculty Advisors and works closely with the Director to establish an agenda. The committee performs five important functions. First, it provides a venue for discussion concerning long-run information technology planning such as establishing network upgrade priorities, identifying potential needs for additional staff, and developing incentives for curricular technology use. Related to the first function is the second, to set budget priorities. The committee uses information from departments about their long-range plans to help establish the direction of broad categories of expenditures. (It is left to the Director to manage budget specifics, including annual departmental allocations.) Third, it serves as a policy discussion forum. As elaborated elsewhere, all decisions on the basic forms and nature of faculty technology support are set within the committee. Issues such as usage privileges are also determined. Fourth, the committee members are campus-wide advocates of the importance of information technology in the curriculum.

The Advisory Committee is by no means a "watchdog" group. We are partners and friends, sharing a role in guiding academic information technology development and use at Carleton.
- Cathy Smith (seconded by Scott Bierman)

What Faculty Think of Their Computing Support

You've got a wonderful crew over there and I am so very pleased with the "attitude" of your staff. If everyone on the campus were oriented the way you run your operation we would all love each other and usual conversation would come to an end.

- Charles Carlin, Professor of Chemistry and President of the Faculty

Not only has the creation of ACNS provided me with the support to implement curricular dreams, it has also led to new inspirations that would have been impossible without the stimulating interactions between faculty and ACNS staff. Our academic computing infrastructure seamlessly interweaves the technical and pedagogical strengths of ACNS staff and faculty with incredible curricular outcomes for our students.

- Susan Singer, Associate Professor and Chair, Biology

ACNS has come to our aid much more vigorously and in a more timely way than ever happened under the old setup. It is great to know that we have truly expert people ready to come to our assistance.

- Kirk Jeffrey, Professor and former Chair, History

[8] There is a separate advisory committee which focuses exclusively on student computing issues.

Adam Smith argued in The Wealth of Nations that division of labor was the prime determinant of a nations growth. What the economics department has learned is that division of labor, combined with good communication between faculty and ACNS staff who view themselves as partners, is the way to provide the best education to our students.

- Scott Bierman, Associate Professor and former Chair, Economics

IV. What Has Not Worked As Well as it Could or Should?

Handling All Levels of Support

In the first year of the new organization, the activities involved in training and developing the confidence of faculty with low skill levels left the Humanities and Social Sciences Coordinators time for little else. The result was that not as much exploration of curricular possibilities as was envisioned and desired occurred. In year two, we hired a one-year "Faculty Support Intern", and her presence meant that these basic support activities no longer dominated the two Coordinators lives. While the intern accomplished what we desired – raising the skill levels of large numbers of faculty – we are currently wrestling with the notion that we may need an intern, someone to take care of the "lower, more mundane " support activities, every year.

While faculty generally understand and agree with the notion that the Coordinators need to be "out and about", it is of course painful for them to have "a crisis" when their Coordinator is not immediately reachable A seemingly unrelated problem... The Coordinators don't get/take as much time as they need to read and learn new things. Why? They are never "off line". The solution, we hope, to both problems will come with the unveiling of *Quickline* in January of 1996. One of five professional staff will answer the Quickline at all times. Because they know faculty will not be left in the grips of an emergency, the Coordinators will now be able to go off line in order to read and learn.

Old Mind Sets Die Hard

Though there is widespread agreement (dare we say, amazement) that so much has changed so profoundly so quickly, we are periodically reminded that years of attitude setting and settling take a long time to overthrow. A few faculty still do not know that they can get the assistance they want/need. Others are reticent "to impose" on their Computing Coordinator for personal attention. The needs- and value-based resource allocation process is not necessarily comfortable to those who used to assume that a certain level of resource was automatically forthcoming because of department of discipline. There are occasional, though rare, staff lapses into a "Don't they know we can't do that?" response to a faculty request. *There's no such thing as too much communication.* - Cathy Smith

Nothing Succeeds Like Success

Faculty desire for technology and technology support services has skyrocketed. We continually strive to do more in order that no needs go unmet. This of course is a source of stress, but stress fortunately balanced by our lengthy list of contributions to the improvement of the educational experience at Carleton.

V. ARE THERE THINGS TO BE LEARNED FROM CARLETON'S EXPERIENCE?

We believe that our experience definitely offers proof that defining services and success *from the faculty's perspective* results in satisfied faculty, high technology skill and use levels, increased and effective curricular technology use, productive technology use, and high return on institutional investment in technology and technology support resources. Central, campus-wide technology organizations *can* provide value-added, customized services.

What is the relationship of institution size to ability to provide such services? One may assume that Carleton can marshal its faculty support model because it is "small" (approx. 1800 students, 180 permanent faculty). We are small. More to the point, however, is the fact that the College increased professional faculty support staff by 200% (and student staff by roughly 100%) in order to re implement faculty technology support. This is a *very* significant increase in investment. It represents the institutional will to maximally leverage information technologies in the evolution of the curriculum, and the institutional commitment to all faculty that they *will* be empowered to effectively utilize increasingly essential information technologies. We believe: the support-staff-to-faculty ratio upon which our model is operating (1 to 60) can be replicated/approached by institutions of all sizes if the institutional will exists; in many institutions, it is staff re-deployment from decades old service philosophies and staffing models, not increases in staff numbers, that are required; all institutions should adopt a similar model if not for all faculty, at least for those who will otherwise be left out of an academic world that has become dependent on technology use.

How much of our "result" is accounted for by structure? By the individuals working within the structure? We obviously believe that the formal model and organization we are using lead to desired outcomes, and therefore encourage others with similar aspirations to consider adopting similar approaches. On the other hand, it is very clear that we would not have the same outcomes we have without a set of individuals inspired and motivated by, and overwhelmingly committed to, our vision and goals.

After the first year of the new model, we had enough of a "track record" that other institutions desiring to redo their methods of faculty technology support began to seek us out. A number have made site visits; all are adopting at least some of our strategies. A foundation has thought well enough of our new approach to provide grant support.

The value of information technology in the education of college students depends on faculty taking the initiative to alter their teaching methods. Faculty have a good idea of where they would like students to end up but often only a limited notion of how information technologies can get them there. Computing service organizations know what technologies exist but have a limited sense of what specific faculty ultimately want to achieve. Hence computing service personnel must work hard to understand what faculty are trying to achieve in order to be proactively helpful. And faculty must understand that computing service staff are important partners in the goal of providing current and future students with a top-notch education and aggressively seek their advice. Without this partnership and mutual recognition of each other's role neither the faculty nor the computing organization will effectively implement information technologies into the curriculum.

ACT--Get Your ACT Together

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ABSTRACT: *Ball State University has been a statewide leader in welcoming students and staff personnel with special needs requirements. The Office of Disabled Student Development has provided a full time coordinator who was charged with the responsibility of removing architectural barriers and to assist in providing the best possible learning environment for all persons attending the University regardless of individual disabilities. Through these efforts the University has been recognized at both the state and national level for initiatives in this area.*

GAINING CAMPUS SUPPORT

Ball State University has been a statewide leader in welcoming students and staff personnel with special needs requirements. The Office of Disabled Student Development has provided a full time coordinator who was charged with the responsibility of removing architectural barriers and to assist in providing the best possible learning environment for all persons attending the University regardless of individual disabilities. Through these efforts the University has been recognized at both the state and national level for initiatives in this area.

During the mid 80's Ball State University began a computer competency program aimed at producing a graduating student population which was both knowledgeable and competent in the use of computing technology in their major area. During this period a concentrated effort was made to include all students, faculty, and staff including those with disabilities. As the program advanced it became evident that a full time coordinator of Adaptive Technology would be needed to deal with grant funding, affirmative action for potential employees with disabilities, special student needs in the area of technology and other legal requirements. This was, as most of you know, a time when the state legislatures were not interested in funding new positions, and our President was not in favor of adding professional staff. This, then, is how Ball State University funded a new full time position and established the Adaptive Technology Program as it exists today.

When President George Bush signed the Americans with Disabilities Act [1], he said "Let the shameful wall of exclusion finally come tumbling down". The legislation took effect on January 20, 1992 and afforded Ball State University the opportunity to focus on the issues of providing proper support in the attempt to provide accessibility to our disabled students, faculty, and staff. Having previously dealt with the problem of architectural barriers Ball State was in a position to concentrate on the technology portion of the issue and how best to meet the needs of the University population. A small coalition including the directors of computing, disabled student development and affirmative action decided to leverage this high interest level into a program of enhanced services and technological infrastructure.

The Rehabilitation Act of 1973 prohibits discrimination against the handicapped within any institution that receives or benefits from federal funds. Being handicapped was defined as "one who has a physical or mental impairment which substantially limits one or more major life activities, has a record of such impairment, or is regarded as having such impairment." Major life activities include: self-care, social life, education, transportation, housing and employment.[2] With regard to higher education, a qualified handicapped person is defined as one "who meets the academic and technical standards requisite to admission or participation in the recipient's program or activity." [3] An institution of higher education receiving such funds "shall take such steps as are necessary to ensure that no handicapped student is denied the benefits of, excluded from participation in, or otherwise subjected to discrimination under the education program or activity operated by the recipient because of the absence of auxiliary aids for students with impaired sensory, manual, or speaking skills."[4] The Americans with Disability Act further required that each service, program or activity conducted by a public entity "when viewed in its entirety" be readily accessible and usable by disabled individuals.[5] This provision specifically dealt with printed materials whether in syllabus form, supplementary reading lists, and tests which must be made available to students in a format which allows the student to display their ability and to allow

for an evaluation which centers on ability and not disability. Braille and electronic reproduction are frequently given the foremost consideration.

Educom has estimated that over 10% of all college students have some form of disability. Current estimates place the number of Americans with some form of disability at 43 million. This includes the 4.5 million students currently in our school systems. These include 40% with some form of visual impairment, and 26% with some form of hearing disability.[6] As employment opportunities for persons with disabilities we can expect an even greater number to be attending the nation's colleges and universities in the future.

The refocusing of issues caused by the ADA gave the University the opportunity to make "formal" a program previously staffed by volunteers. The timing and synergy generated allowed the establishment of a program budget supported by funds from the offices of the Provost, President, and V.P. for Student affairs. This budget allowed the university to hire the first full time coordinator of adaptive technology. The University Computing Services budget provided funds for the hardware, software, and supplies to start the Adaptive Computer Program (ACT) and this in turn has generated grants and other gifts which permitted a significant leveraging of the initial investment.

BUDGETING AND RESOURCES

In the university structure this program is unique in having multiple offices sharing the fiscal responsibility. The newly appointed coordinator was allowed to select the hardware and software and these items, in addition to the several items previously purchased by the departments of Computer Science and University Computing Services comprised the beginnings of the new program. The coordinator provides a yearly request for hardware and software which is prioritized by areas of need. Most of these purchases are taken from the University Computing Services budget but it is not uncommon for special needs to arise during the year which are unanticipated and which are supported by other university departments.

The position taken by the University is that providing access to technology is a University function and as such should be funded cooperatively by the areas affected. We feel that this willingness to share resources among departments sets Ball State University apart somewhat from the norm. The ADA specifies that certain accesses shall be provided by the university and so the university funds certain of these through the central administration. Other requirements made during the academic year might be funded by a department or through a cooperative sharing of resources. This sharing precludes the need to "own" the service or technology provided. It is just such willingness to provide rather than to own which has made the program so successful.

Under normal circumstances it is within the purview of the Purchasing department to secure pricing and negotiate with vendors, however, due to the extensive background and knowledge base of the director a great deal of latitude has been granted in this area. By virtue of having an extensive technical background the Coordinator has been able to request and obtain certain configurations of hardware and software which have been particularly successful in solving problems with providing access to University technology. In some cases vendors have willingly given discounts on items which were used in special applications in exchange for the feedback generated. This has turned out to be a win-win situation for both the vendor and the University.

We still continue to do Beta testing for both hardware and software vendors. This cooperation has resulted in a number of applications which are currently being used and refined and which benefit both the vendor and the user as these refinements result in more sophisticated solutions to accessibility problems. The main recipients of the benefits thus created have been the students which have gained a degree of accessibility that might have otherwise been unavailable to them.

All of this is a reflection of the attitude of the University in responding to the needs of the students. Money and space are two items which are normally held sacred to a budgetary unit within the University. Ball State has been successful in breaking down this tradition with the attitude of sharing and cooperation. This has allowed us to not only follow the letter of the law but to exceed its expectation to the benefit of the students and faculty.

ACT PROGRAM SPECIFICS

The pervasiveness of computers and electronic information systems which has developed within the last few years has been met with a degree of apprehension by the "technophobes" within the general population. Much of the disabled population has, however, embraced the new technology as a means of increasing their independence and functionality. The integration of hardware and software systems which are designed to meet the needs of those individuals with disabilities is the crux of the adaptive computer technology program. Screen reading and optical character recognition software combined with voice synthesizers and scanners allow visually impaired individuals freedom of access to texts, journals, and other documents that permeate the collegiate atmosphere. Keyboards which are specifically designed for students with disabilities combined with voice recognition technology and artificially intelligent word processing software help mobility impaired students prepare their class assignments, term papers, and other requirements for the successful completion of their course work. Intelligent communications software enables the hearing impaired individuals to converse with others through the telephone without the need for interpreters. These adaptive technologies continue to break down the logistic and time barriers which persons with disabilities face on a daily basis.

Close cooperation and a clear sense of direction are required if the program is to be implemented successfully. The ACT program at Ball State University is directly involved with fulfilling the goals and mission of not only University Computing Services, but those of the University in general. The ACT coordinator works closely with the heads of the academic units to ensure that the departmental educational objectives are facilitated for students with disabilities within specific major areas of study. Technological resources provided by Media Services, University Libraries, and other non-academic areas are utilized as required to provide effective access to the information necessary for a successful educational experience.

The University mission statement charges that we produce graduates who are "able to analyze information, think critically, solve problems, communicate effectively, and demonstrate competency with computers."[7] Students with disabilities are continuously faced with informational access barriers. The ACT program facilitates access to information, thus allowing the students to play an active role in planning and implementing specific adaptive measures which target individual needs. The ACT training further provides students with a foundation in computer literacy as well as advanced usage techniques. Access to documentation resources allows students

to become both knowledgeable and independent. This program also provides disabled students with the knowledge and ability to solve information access problems that translates directly to employment situations which will be faced after graduation.

"BALL STATE UNIVERSITY 2000" is a list of goals and objectives with which the ACT program is also concerned. This list was prepared by the University faculty and administrative staff to launch the University into the twentieth century. The ACT program is actively involved in producing graduates which are sought by employers and graduate and professional schools by providing them with the tools necessary for effective access to information and technology. Work experience opportunities are provided through the ACT lab assistant and management positions. The program Coordinator consults with employers who provide internships which address and resolve accessibility issues. The ACT Coordinator consults with faculty to devise strategies which will ensure access to course materials. Emerging adaptive technologies are continually investigated and evaluated so that we can provide the most effective access possible. Students are encouraged to take responsibility for their education and to work with adaptive technology as a means to pursue their individual educational goals.

Through consultation with primary and secondary educational institutions programs are designed that ensure a proper foundation in basic technique is provided for students with disabilities who plan to continue with post secondary education. Accessibility issues concerning distance learning opportunities provided by the University are also addressed by the ACT program Participation in recruitment, orientation, and preparation of prospective students has made Ball State University a leading provider of accessible educational opportunities to persons with disabilities.

This program is a direct extension of University Computing Services. UCS is charged with "offering a wide range of computing and systems services to students, faculty, and staff. University Computing Services strives to provide those within Ball State University with the equipment and services required to complete their respective objectives."[8] The program exists to provide access for disabled students to the general services provided by UCS. The program further allows access to the mainframe system, as well as resources provided by individual department computer labs. Internet services are also facilitated by adaptive technology. UCS provides the services while the program gives students with disabilities access to the services.

Specifically, the program's mission is to provide "equal access to computing services to all persons with disabilities at Ball State University." This is accomplished by direct education of students as well as faculty development efforts aimed toward making course work accessible for disabled students. The program provides reasonable accommodation for students, faculty, and staff with a wide array of equipment and supportive services by enhancing existing academic and computing facilities. This is done in accordance with the University mission, computing Services mission, Public Law 504 and the Americans with Disabilities Act. The mission of the Adaptive Computer Technology Program at Ball State University is, therefore, a synthesis of all these missions. The University provides the philosophical impetus, while UCS provides the technological base.

The Adaptive Computer Technology committee was established in 1990 to facilitate the communication between various units of the campus which were involved with disability issues as well as faculty, staff and students with disabilities. Membership includes, but is not limited to, the Directors of University Computing Services and Disabled Student Development, Coordinators

of University Computer Labs, University College Learning Center and Adaptive Computer Technology, Assistant Dean of University Libraries, Chairperson of the Computer Science Department, Media Services personnel, Indiana Vocational Rehabilitation regional management, and a representative from each of the four predominant disability populations on campus. Members are responsible for long-range planning, unit requests for services, budget proposals, and dissemination information to individual campus units. Although the ACT committee is considered an ad hoc delegation, the University-wide Americans with Disabilities (ADA) committee has been kept apprised of proceedings and developments. The ACT committee has six meetings a year with impromptu meetings as needed to insure continued commitment to the ACT mission.

The ACT coordinator is responsible for maintaining the adaptive hardware and software which is located in various labs throughout Ball State University and for those faculty and staff who have adaptive technology allocations. Requests for adaptive services are directed to the Coordinator, and equipment and resource allocation decisions and logistics are supervised by the ACT Coordinator. The Coordinator is also responsible for resolving all information accessibility issues which occur at Ball State University.

Familiarity with advances in the field is another important aspect of this position. The ACT Coordinator anticipates the needs of clientele with disabilities and is responsible for acquiring and implementing new technology, configuring and integrating new technology with existing systems, authoring grant proposals, beta testing products and studying the feasibility of new adaptations. Training sessions and workshops are routinely conducted to ensure the equipment and software is used properly and knowledgeably by the target population.

The primary ACT facility on campus is centrally located adjacent to the twenty-four hour access computer lab and is staffed 72 hours per week. Lab assistants are recruited from the disabled student population. These assistants are trained in basic computer use through the University Computer Lab training program and also receive adaptive technology instruction through a peer training program. Peer training provides the facility with student employees who are familiar with the adaptive equipment in the lab and who respond to service requests in an empathetic manner.

The primary ACT lab also serves as an assessment and training center. Persons with disabilities are encouraged to experiment with various adaptations. Exposure to a range of modifications, from varying price ranges, students are much better prepared to compete in the job market upon graduation. The experience with various pieces of equipment allows students to be more articulate in defining their needs in interviews with prospective employers.

The primary lab is open to University personnel for visitations to foster an understanding of what equipment is available and how its use can improve and enhance the teaching experience. Workshops are also conducted in the lab to assist incoming students in the use of appropriate adaptations and as preparation for required computer literacy course work.

Lab usage data has been compiled since 1991. Approximately 250 usages per semester were logged during the first year of existence. As new equipment was obtained and new adaptations were created the lab hours were extended and a full-time Coordinator position was created. Since that time the use of the primary facility has grown to approximately 1,500 usages per semester.

With approximately 450 students with disabilities registered for support services, an estimated 85% of the target population is currently served by the ACT program.

This increased demand for services necessitated the distribution of adaptive equipment to other University Computer Labs and Departmental facilities. Our program currently has adaptive resources in five additional UCL computer labs with equipment available upon request into other UCL facilities. Adaptive equipment is also currently available in three University library locations, the Office of Disabled Student Development, Students Services computer lab, two computer science departmental labs, two English departmental labs and the Business department.

Another crucial aspect of the ACT program is inservice training. Fundamental training for University personnel in facilities with distributed adaptive equipment is provided by the ACT Coordinator. Knowledgeable staff provide a resource for the users, as well as the Coordinator, and serve as contacts in the event of equipment malfunction.

Adaptive technology products are provided through a short-term loan program. This program has proven beneficial for students who need a product for a specific course and occasionally for those who may not have immediate funding available for their own equipment. The individual loaner program also serves as a vehicle for off-campus agencies to determine if a specific adaptation is appropriate for a client before a purchase is made. Adaptive equipment can also be loaned to academic departments exhibiting a temporary need. Short term distribution of equipment allows adaptations to be placed in an area of need only for the term of the need. Keeping the equipment in areas of need helps conserve campus resources and keeps a balance of adaptive inventory available.

The ACT program is part of the Academic Support Services group of University Computing Services. Consultation is provided for all campus units which includes recommendations for planning and purchasing. These recommendations are then sent to the University President's office, offices of the Provost and involved department chairs, Americans with Disabilities committee, and the Affirmative Action Office.

The ACT program also assists campus units to comply with requests for alternative media by individuals with disabilities. This includes braille, large print and electronic formats for pre-admissions information, syllabi, course handouts etc. The ACT Program is also involved in a full-scale effort to provide all University publications in electronic format for easy access via the mainframe computer systems. Course offerings and scheduling, campus phone directories and information, as well as student newspapers and employee publications are also included in this effort. The Coordinator also pursues information sharing and problem resolution by participation in various associations concerned with disability issues, i.e. National and State Associations of Higher Education and Disability, Equal Access to Software and Instruction, and the International Committee for Accessible Document Design, to stay abreast of current legal and ethical trends.

In order to anticipate and correct access limitations, the Coordinator meets regularly with the offices of Affirmative Action, Disabled Student Development, as well as the Americans with Disabilities Act committee, collegiate deans and departmental chairpersons, University Libraries, University College Learning Center, Media Services, and Facilities Planning personnel. Membership on the ACT, Campus Wide Information System, Indiana Higher Education

Television System, Indiana Association on Higher Education and Disability, Vocational Rehabilitation, and Office of Services for the Blind, as well as search and selection committees gives the Coordinator direct participation in establishing and implementing disability policy across the campus and the state.

The ACT coordinator enhances public relations and promotes the program through presentations at state, national, and international conferences, publishes articles about the program and adaptive technology, consultations with other education institutions and governmental agencies, guest lectures to undergraduate and graduate classes, as well as ACT program documentation.

Ball State University is committed to compliance with the Rehabilitation Act of 1973, Section 504, and the Americans with Disabilities Act of 1990. Based on the National Institute of Disability (NID) publication, "The Impact of Exemplary Technology-Support Programs on Students with Disabilities," Ball State developed a checklist of services to be provided. All applicable categories of service are being addressed or implemented by the ACT program. Additional services, not specified by the NID report, are also being provided to individuals with disabilities. The "Checklist for Implementing Accessibility in Computer Laboratories at Colleges and Universities," published by the Trace Research & Development Center, is also followed by the ACT Program Coordinator. Nearly all of the recommendations listed have been implemented and the remaining applicable items have been addressed in the new ACT budget. With this leadership and focus, the program assures enhanced electronic accessibility for students with visual, mobility, hearing and learning disabilities at Ball State University.

NOTES

[1] Campus Update. Vol. 12, Nbr. 24,p.1., Feb. 24, 1992
[2] Section 504, Rehabilitation Act of 1973, Regulation Section 104.3 (j)(1)
[3] Ibid. Section 104.3 (K)(3)
[4] Ibid, Section 104.44 (D)
[5] Americans with Disability Act, Title II, Section 35.151A
[6] EASI Computer Access Facts, EDUCOM, Washington D.C.
[7] From Ball State University Mission Statement
[8] From University Computing Services Mission Statement

Back to the Future -- A Management Perspective on Distributed Support

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Abstract

In spring of 1995, Information Technology at Rice University began to implement a distributed model for computing support. The approach decentralized customer support into the academic divisions.

The model involves matrixed teams from across Information Technology, the Library, and existing departmental staff. The academic division provides office space and a faculty advisor for the team. The team provides one-on-one or small group training, consulting, reference service, and systems administration. IT facilitates a campus-wide view of technology and architecture, maintains a central view of budget and staff, is accountable for service level commitments, provides core services such as mail and news, and provides technical support for team members.

This paper will address management aspects of distributed support. We will focus on the implementation process, changes that were required in transitioning from a strong centralized organization to a distributed/central model, the opportunities and challenges that are being faced in the implementation, and what we have learned so far.

Retrospective

Prior to 1995, Rice University's Information Technology division used a traditional centralized model to support the computing needs of our 6000 users. Over the last two years, we had distributed one consultant into each academic division, but our focus was still on central services. These services were available to the entire University community, but several departments chose to fund their own computer support personnel from research grants.

In the spring of 1994, many systems support personnel across all departments were folded into the IT organization. At the same time, top management in Information Technology demanded a dramatic change in customer satisfaction. These two factors led to the distributed teams support model.

Distributed Teams Model

Under the distributed teams model of support, Information Technology staff and reference librarians are assigned to matrixed support teams and dedicated to specific academic divisions. Each divisional dean appoints a faculty advisor to set priorities for resource allocation within that division. An Information Technology director is assigned to each team to resolve escalated issues and facilitate communication.

Process

To implement the distributed teams model, the IT directors developed a concept document that was reviewed with the Vice President and the Executive Director. This document included a description of the distributed teams model, problem resolution goals, a description of base level services, and a standard suite of supported software. The draft went through many iterations and was then shared with the deans, their designated divisional advisors, and key faculty.

- Division Perspective

Under the new model, the division provides space for the team and a faculty advisor. The faculty know their support staff by name and face and have easy access to team members. The team provides continuity of support for projects across the division.

- Team Perspective

The team knows who their customers are and can provide better day-to-day and long-term project support. By working closely with their customers, the teams can observe how the faculty use computers in their teaching and research and can show them new ways to enhance their productivity. Team members pool their expertise to resolve difficult problems and have designated staff in the central second level support group to help them resolve technical issues. A clear path for prioritization and escalation is provided through the designated division advisor and IT management.

- IT Perspective

IT facilitates a campus-wide view of technology and architecture, maintains a central view of budget and staff, is accountable for service level commitments, provides central services such as mail and news, and provides second level technical support for team members.

Management Expectations

The management team expected the move to divisional teams to create a quantum leap in user support, so we developed several goals and expectations for results:

- Customer satisfaction must improve 100%.

We made the commitment to improve customer satisfaction by 100% during the first year of distributed support. The results of a survey given before and after implementation will provide the data needed to see if we have met that goal.

- Communication is critical and must be maintained.

Communication is critical at all levels, within the team, between each team and the rest of the IT staff, and most of all between the directors.

- Users set their own priorities.

Each division is expected to set their own priorities for computer support through the divisional advisor and the teams.

Our Approach

Our vision for divisional teams was based on several approaches -- deployment, well defined staff roles, and problem resolution.

- Deployment and collocation

The directors of each department within Information Technology reviewed the skills of the staff members in their group to determine how to fill the team roles. Considerations were made for interpersonal skills, maturity and judgment, ability to work with minimal supervision, and leadership capabilities. Each director then discussed the distributed team concept and specific team assignments with their staff. Reaction ranged from enthusiasm and skepticism to belief that the project could not work. When several staff chose to leave the university rather than participate, management used the opportunity to hire professionals whose skills rounded out the teams.

The divisional deans were asked to provide space for the teams. Engineering and Natural Sciences provided space quickly. Architecture and Music used a

previously allocated space. We are working with Social Sciences to provide space before the spring. We do not expect space to be allocated within Humanities for several years until some of their space constraints are addressed.

- Staff Roles

The team leader is responsible for determining how the teams will dispatch problems, escalating issues to management, and providing feedback on the performance of team members. Consultants provide one-on-one or small group training and front-line user support. Reference librarians are responsible for providing reference service and training, and system administrators provide first and second level support. The central group maintains central resources like mail and news, provides technical expertise to staff members out in the field, and manages campus-wide projects such as operating system transitions, volume purchases, and site-license management. Second level staff are designated to support each team and may be directly contacted.

- Problem Ownership

Under guidelines set by each divisional team for problem dispatch and assignment, staff are responsible for following a problem through to resolution. Whether they solve the problem themselves or call in second level resources, they are still required to monitor the status of the problem and assure a satisfactory resolution.

Operations

Implementation of distributed support resulted in some major changes, opportunities, and challenges for the management team.

Changes

Given the redeployment of staff, we had to rethink our business in several areas. We needed to create a unified service philosophy, distribute the HelpDesk, transform our training program, and create new communications paths.

- We need a unified service philosophy.

While we were planning the support model, we felt that it was important to create a service philosophy in the agreement with our users. After analyzing our consulting data, we determined that 70% of the demand was solved on the front-line, 20% with a call to second line support, and 10% required investigation. We crafted these general goals and more specific task-related goals into a service agreement (Appendix A). With this agreement, we can better manage user expectations, and the staff is held accountable for meeting the goals.

- We now have many HelpDesks.

Under the new model, we distributed the HelpDesk. Consultants who formerly worked on the HelpDesk were deployed on the divisional teams and took that function with them. The central HelpDesk is run by students for students and is managed by a staff consultant.

We still support a central helpline, but users now get a menu that enables them to select their divisional team or the student HelpDesk. Faculty and staff are referred to their support teams, and students are referred to the central support desk.

- Our training coordinator does a lot of walking.

Given that we deployed two thirds of the training staff into the teams, we needed some creative approaches to handle the training load. First, we relied on the teams to provide "just in time" one-on-one training for the faculty and staff. We also met with the teams to set up a monthly schedule for central training in the divisions, and were proactive in anticipating needs. For example, we knew that wiring the residential colleges would create a demand for training, so our student trainers were ready to teach classes when the wiring was completed. [1]

- How can I get a hold of you?

When staff are distributed over the campus, the need for communication intensifies. While good relationships among management and the staff enabled the change to occur in a less dramatic way, we needed to rethink our information flow. When everyone is located in the same building, you can go down the hall to find a staff member. When that person is located across campus and is out working at a customer site, the problem is more challenging.

To help us in communicating, we used a multifaceted approach. Our staff used traditional electronic communications like electronic mail, listserv lists, and the problem tracking system. To facilitate one-on-one contact, we issued beepers to support staff and management and created an e-mail paging service. We also had to increase the number of scheduled meetings; informal meetings that happened "at the refrigerator" now must be scheduled.

Opportunities

Dramatic changes often bring new opportunities. These opportunities include partnering with your users, reaching your faculty, and using technology to work smarter. The key is to recognize the opportunities and take advantage of them when they occur.

- How can we partner with our users?

We find that our divisional teams are now allies for a common cause with their divisions. As partners, we work together with the faculty to justify additional staff resources and make joint proposals for lab space. Our staff also influence computing purchase decisions and direct their clients to supported platforms.

- Are you reaching your faculty?

By living in the same space with the customers (i.e., "breathing the same air"), our staff start to learn about their research interests and their needs. As a manager, you need to take every opportunity to ask faculty how they are being served. Whether you are walking across campus, waiting in line at the faculty club, or visiting a faculty office, you should take advantage of the moment to inquire about the job your staff are doing. Are they getting good responses? Is the information timely? What have we done for you recently? If the response is, "Joe who?", you know you have problem to investigate.

- How can we use technology to work smarter?

In the Information Technology business, we have a mandate to integrate technology into education, research, and administration. As we distribute our staff, however, we need to use this technology to help us work smarter:

1. Our problem tracking system captures twice the information that it used to - data from the central HelpDesk and data from the divisional teams. What can this data tell us? What are the trends in our divisions?

2. As we wired the dorm rooms for cable TV and ethernet this summer, we realized that we could use the cable network as another way to train students. This year, we will pilot internally developed and commercial training videos. Will this program reduce our need to offer central classes for the students?

3. An interest in telecommuting resulted in an ISDN pilot project. The project was successful and is being expanded to accommodate additional users. How will management need to structure jobs and communication for this program to succeed? How will the telecommuting model affect the distributed teams?

4. We are installing video conferencing capabilities in a new classroom in the library and recently acquired several Mac-based video conferencing packages to test among the staff. How will video conferencing enhance our team interactions? How will it help facilitate distance learning opportunities? Will we start putting our ISDN addresses on our business cards?

Challenges

Migration to a new support model presented several challenges to the management team in the areas of staffing, supervision, client differentiation, and consensus building.

- We really will do more with less.

Allocating most of the staff to divisional teams means that fewer staff are available to deal with crises or new projects. This translates into better planning among the teams and management. For example, our HelpDesk is staffed primarily by students to support students. During mid-terms and finals, however, students focus on their studies and are not available to work consulting shifts. Students still need consulting help, so we have to be creative in finding a solution. In this case, we called upon staff in the divisions to work the desk. The staff were glad to help and enjoyed renewing their skills and working as part of the central team.

- Lack of interpersonal skills is exposed.

User Services staff are hired based on a combination of interpersonal and technical skills. Until recently, other parts of the IT organization based their hiring decisions primarily on technical skills. When some of these backroom staff were assigned to teams, they had to rethink their interaction styles. In the short term, several staff are in an uncomfortable position. Over the longer term, we are hiring staff who can communicate with our customers, so this problem should go away.

- How do you monitor what you cannot see?

Several divisions were concerned about how deployed staff would be supervised. Given that staff work all over the campus, how can you monitor their performance? Our solution to this challenge was to upgrade our public domain mainframe problem tracking system to a commercial grade Unix problem tracking system in August. We developed log sheets on HTML forms that allow staff to track their work and report problems that need additional resources for solution. We also developed summary reports that are posted to the entire IT organization, the team faculty advisors, and RiceInfo. The reports analyze incidents by division, problem areas, and team.

The key to this approach is that the teams want to get credit for the work they do. It helps the faculty understand how they are spending their time, and the staff know that we need to document the load to justify additional resources.

- Some clients were used to premium service.

Under the previous support model, some clients paid for contract support and received a premium level of service. The rest of the campus participated in a first-come, first-served model. With the new model, all clients receive the same level of support.

- It is difficult to reach consensus on software standards.

When we first conceived the support model, we wanted to put some boundaries on the number of software packages and platforms that the teams would have to support. We realized that it was unrealistic to expect every staff member to be fluent in every package, and we also recognized that each division had some discipline specific software needs. To overcome this challenge, we worked with the staff to develop a supported software list. The list also gave us a way to focus training efforts for staff and students. While the

concept looked great on paper, the reality is that the staff will support whatever their divisional faculty want them to.

- And more are on their way.

We have been using matrixed teams for over 5 years. Our current support model adds one more level to the matrix. We will be evaluating how to continue growing our team model and will look at use of self-directed teams and ISO9000. We will also look at our reward model -- team-based support needs a compensation and evaluation model that rewards successful team participation. In addition, the departments want the funding for their teams transferred into their budgets. How would that change the balance?

Progress Report

The model is working. IT management and the teams regularly receive positive feedback from the deans and the faculty. Irate faculty calls to the Vice President's office have been dramatically reduced.

The implementation of the distributed teams support model is a work in progress. We will give an update when this paper is presented.

References

[1] Martin, Andrea and Diane Butler. "Taking the Show on the Road: Training in a Distributed Support Environment." Proceedings of the ACM SIGUCCS User Services Conference XXIII, October 1995, pp. 193-195.

Appendix A: Problem Resolution Guidelines

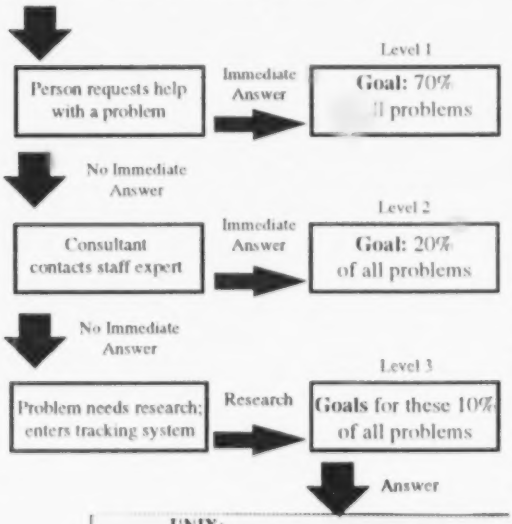
Problem Resolution Goals

Our objective is to answer all questions and resolve all problems immediately. Realistically, we recognize that this is not possible in every instance- but our goal is to solve 70% of all incoming problems at initial contact. See the sidebar for examples of questions that can be answered quickly.

If a problem cannot be solved by consultants on duty, they will contact a staff expert for assistance. Our goal is to solve 20% of the incoming problems at this point, Level 2.

If an expert cannot be reached or a problem requires the assistance of technical staff, the problem will be entered into our problem tracking system. For a detailed breakdown of turnaround times for specific types of Level 3 problems, look on the facing page. (All time frames are given in working business days.) If a microcomputer problem cannot be solved over the phone, an appointment will be scheduled for a consultant to visit your office.

Once a problem is entered into the problem tracking system, one consultant "owns" the problem and will ensure that the necessary staff members are contacted to help solve the problem.



UNIX:	Micro:
10% - up to 24 hours	50% - up to 24 hours
10% - up to 2 days	30% - up to 3 days
30% - up to 3 days	20% - up to 15 days
20% - up to 7-10 days	
30% - up to 15 days	

Quick Solutions

- Regenerate a new password for a forgotten one
- Explain how to get an account
- Assist with logging on troubles
- Distribute software, such as communications (MacSlip, PC[illegible]up) or virus protection programs (Disinfectant, F-Prot)
- Answer questions on supported programs, such as electronic mail (Elm, Eudora) or a word processor/ editor (Microsoft Word, vi, Gnu Emacs)
- Explain how to access Rice computer systems from off-campus
- Point to information on a specific computing topic, such as documents or to RiceInfo
- Recover a damaged file on a floppy disk
- Respond to basic questions on the commands of the UNIX, Macintosh, and IBM operating systems, such as how to print, how to FTP a file, backup and recovery procedures
- Explain how to access the Internet
- Much more!

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COLLABORATING FOR THE MORE EFFECTIVE INTEGRATION AND USE OF TECHNOLOGY

Track IV: Rethinking User Services
29 November 1995, Wednesday, 2:45 pm

Kenneth E. Pflueger, CIO
Director of Information Services
California Lutheran University
Thousand Oaks, California

Abstract

Like many other institutions of higher education California Lutheran University made a substantial investment in a very sophisticated technological infrastructure, but questions remained as to whether technology would be utilized widely and fully. In particular there was great concern about whether it would be utilized to enhance the teaching/learning environment at the University by a substantial number of the faculty. A task force representative of faculty, human resources and ISS was charged with evaluating past efforts and proposing strategies for the future. The old strategy had consisted primarily of short courses on particular software or demonstrations of possibilities. The evaluation results indicated that while the old strategy had a place, continuing the same type of activities was not going to further our goals. A new strategy was proposed and implemented which combines certain types of training with new employee training as well as with programs for existing employees. The program has two major parts to it, both focusing on peer mentoring as the chief approach. The first tier deals with competencies in a set of predefined technological skills while the second tier focuses on competencies and skills in specific software or applications. The results of the evaluation after the first year of the new program indicate resounding success.

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Background

California Lutheran University (CLU) is a small, comprehensive university with about 2700 students and 110 full-time faculty, 29 majors and 4 Masters' degree programs. During the months of July/August 1994 the University underwent a major transformation with the installation of a new ATM ready digital phone system, a fiber optic backbone with all staff/administrative/faculty offices, classrooms and the residence halls (one port per pillow) connected to the campus network with level 5 copper. The University went virtually overnight from a couple of pockets of technology with two stand alone local area Novell networks, to having more technology than most people knew what to do with, and all interconnected.

Introduction

This major commitment of resources by the University thrust technology into the forefront of the University's strategic planning process which includes as a major goal the integration of the use of technology into the operational and educational environments of the University. I believe that the prioritizing of this goal helped foster an environment that was open to collaborative efforts. The University's commitment to technology and its desire to get the most out of its investment

were further inducements to collaboration as the University continued to define and refine its vision for a sophisticated, user centered technology infused into all aspects of university life.

Four sub-goals have been delineated under this main goal:

Instructional Goals

Utilize technology to enhance the quality of student/faculty interactions.

Integrate technology significantly into the teaching/learning environment in order to equip students and faculty with knowledge/skills they will need to live and work in the 21st century.

Administrative Goals

Utilize technology to increase the efficiency and effectiveness of work processes.

Provide students with a higher level of service and more timely information.

Implementation of Goals

These goals presented a tremendous challenge to the Office of Information Systems and Services (ISS) which was charged with providing leadership in accomplishing them. These goals, however, have also ushered in a period of great professional and personal satisfaction and collegiality among ISS staff and across the entire campus. In the tamer pre-network days (pre-September, 1994) a fairly traditional training program was conducted with academic computing, the library, administrative computing and telecommunications each providing their own workshops. While the workshop offerings were aimed at raising the skill level they often ended up being sessions aimed at trying to convert people to use technology. In retrospect, the training programs were, more often than not, too general and did not address the specific needs of individuals and departments at CLU.

Evaluation of Former Training Program

Post-network and with the integration of these separate areas (academic computing, the library, administrative computing and telecommunications as well as media services) into the Office of Information Systems and Services, it became clear that the former training efforts of exposing people to as much as possible and hoping that they would use something was not going to be adequate to achieve the University's goal. This was confirmed by a survey which was conducted of users to ascertain their perspective and provide information for the development of a new training program. The survey results are captured by the following comments:

- The courses are too advanced for me and I felt lost.
- Too much time was spent on basic things that I already knew.

- It was interesting, but I cannot see how I would use it.
- It worked in the lab, but I could not get it to work on the computer on my desk.
- Too much material was covered in too short a time.
- Not enough time for hands-on.
- I really do not have time to do anything with what I learned.
- I don't go because I am so computer illiterate that I could not learn anything in the class setting.

None of the comments really surprised members of the ISS staff. The last comment reminded us that as a small campus people were used to more personalized attention: we agreed that we needed a new approach and that the new integrated organizational structure for ISS would serve as the means to define that approach and to actualize it. As an integrated department ISS was best positioned to provide leadership for a collaborative training effort since its responsibilities cut across the University: computer basics, phone/voice mail, applications software, HTML, and bibliographic instruction.

ISS put together a task force made up of faculty, staff and administrators to collaborate in planning a comprehensive and yet user specific training strategy. Members were chosen because they could network with other related committees on campus. For example, one of the members is active in the University's Teaching and Learning Center for Faculty Development, another is a member of the University's General Education Committee, another is on the steering committee for the University's middle management organization, etc. The membership of the Task Force was as follows:

CIO
Director of User Services (ISS)
Dean of the College of Arts and Sciences (Liaison with the Academic Council)
Faculty (TLC)
Faculty (General Ed. Committee)
Faculty (Grants Office half-time)
2 administrative staff (middle manager)

The Task Force met in several brain storming sessions to develop a new approach to training that would address the concerns raised in the survey. Several recommendations came out of this process:

- The Task Force should function as the coordinating and evaluating body.

- Since ISS cuts across the institution in terms of its functions and the constituencies it serves, it should be the primary vehicle for delivering and/or managing the delivery of training for faculty and staff, and should team up with faculty for delivery to students.

- The Task Force should identify and recommend a list of basic computer competencies which would be required respectively of all faculty, staff and students.

- HR should work with the various managers within the University to review position descriptions and update those descriptions to include the requisite technical skills using the "basic competencies list as a starting point.

- Managers would use the revised position descriptions to evaluate an employees abilities and identify skills that were either weak or lacking and based on that assessment develop a plan to address those deficiencies for each staff person.

- A special handout with a list of courses from the course offerings would be developed for all new employees. New students would be expected to take an introductory workshop to the campus network during the first weeks of the semester.

- The resultant training program should be of a more personal nature and reflect the particular needs of CLU.

Basic Competencies

The Task Force recommended the following as basic competencies for faculty and staff. Greater priority was given to getting faculty up to speed in order to expedite the impact on the classroom. The Task Force set as a goal the training of 90% of the faculty in the basic competencies by the fall of 1996. These basic competencies were defined as follows:

- E-mail - communicate electronically on and off campus. Make new messages, reply to messages, forward messages, file messages, make address books, attach files to messages.

- Operating Systems - use the basic functions of file management and information sharing between applications. Back-up data, copy files, develop organized file storage system using folders/directories, ability to move information between applications using copy/cut and paste.

- Internet - know when and how to use the various tools for research and teaching. Use Netscape to access the University's Home Page, search the WWW and Gopher (use search tools such as WebCrawler and Lycos), become familiar with WWW directories and browsing strategies (tools such as Yahoo, Whole Internet Guide, etc.) to identify electronic sources of information for research and teaching or for use in a particular administrative office.

The liaison from the Task Force with the General Education Committee of the faculty was

charged with taking the basic competencies list to the General Education Committee which has been charged by the Academic Vice-President with developing a similar list for students as part of a revision to the University's core curriculum. (As well as address more advanced skill levels.) The Core Revision Proposal is to go before the faculty in the spring semester 1996 for discussion and a vote.

Proposed Training Program for Faculty

The proposed training program for faculty has two parts:

1. A program to address teaching the basic competencies to faculty.

2. A program to address developing advanced skills and applications beyond the basics.

The group looked at the results of the survey evaluating the former program and the recommendation for a personalized approach and decided to try utilizing a mentor model as the programmatic approach for dealing with basic competencies. The model was tested on a select group of the faculty in the spring of 1995. Faculty who had shown themselves to be relatively technically sophisticated were polled and asked if they would be interested in mentoring two of their colleagues in a set of pre-defined basic technical competencies.

The time commitment and suggested format of the mentoring was as follows:

> Minimally, an initial two hour meeting with two additional one hour meetings as follow-up about two weeks after the initial session. During the time between sessions, the mentor should make a concerted effort to keep in touch with his/her faculty mentorees, sending them e-mail regularly, responding to any questions, etc. During the sessions, but in particular, in the two follow-up 1 hour sessions, in addition to reviewing the basic competencies and answering questions, mentors spend some time talking with the faculty member about the ways he/she use technology and probe the potential ways the faculty member might incorporate the use of technology into his/her courses.

We ended up with 12 faculty who said they would be interested in serving as a mentor. To select the test group of mentorees the Task Force reviewed a list of full-time faculty and set the following criteria for asking someone to participate:

1. Prior expression of interest.
2. Has attended a workshop before, but expressed frustration, etc. over use of technology.
3. Knowledge of someone in the group of an interested potential user, but someone who was not proficient.

Twenty-six faculty were identified as potential mentorees. Each faculty member was personally contacted by the Director of ISS and asked if they would be interested in participating in the test of this new delivery system. Of the 26, 23 said yes and two more called to ask if they could be

part of the initial group, so we started the initial program with 12 mentors (4 women and 8 men) and 25 mentorees (11 women and 14 men).

An initial survey was conducted of mentorees in the summer of 1995 to evaluate their initial response to the program and to provide us feedback on whether or not we should move to implement the program on a large scale in the fall of 1996. A more formal evaluation was also developed by two faculty which was designed to do more in-depth evaluation of both the mentors and the mentorees. This evaluation was conducted by two faculty members and one ISS staff member. Their findings are awaiting publication. The initial survey conducted by ISS in summer, 1995 had very positive results:

- A small number of faculty indicated that they had not had the time to follow through and meet with their mentor.
- One mentor admitted not having followed through with his assigned faculty.
- The response was resoundingly positive. All participants commented on their appreciation for the personalized one-on-one interaction which allowed them to ask questions specific to their own needs.
- Mentorees also indicated that having the sessions in their own office on their own computer was very beneficial.
- Several mentorees stated that they appreciated the experience because now they had a colleague they could call on for additional advice and discussion about technology.
- Three mentors have even gone one step further to develop joint efforts to integrate technology into their teaching with their mentorees.

Did the faculty actually learn what we hoped they would? A difficult question since we were not about to put ourselves in the position of giving a test to faculty. We decided rather to evaluate our success based on the performance of these faculty in subsequent workshops requiring use of the basic competencies. The proof of their learning was evident as they participated in the second half of our training program which consists of a series of workshops focused on specific applications of technology to teaching. Of the original 25 mentorees, 13 took part in the summer, 1995 workshops. Workshop leaders were asked to pay particular attention to the performance of these faculty so that we could make some judgment regarding the success of the mentor program. The performance of the mentorees who took one or more workshops in late summer/early fall, indicated that our mentoring program was a great success. These faculty were able to move through the workshops with few problems and all are now using one or more new found techniques this semester.

Presently, twenty-five percent of the full-time faculty are being targeted for participation in the mentoring program each semester so that by the end of the 1995/96 academic year, 95% of all full-time faculty will have participated in the mentoring program.

Training for Integrating Technology into the Classroom

The possession of the Basic Competencies by faculty are considered the essential foundation in order to accomplish the goals of the University related to technology and instruction, and are pre-requisites for taking the advanced workshops offered to faculty. To address the use of technology to enhance student/faculty interaction and to integrate technology into the teaching/learning environment, a series of workshops have been developed for faculty which focus specifically on the accomplishment of these goals. Our target goal is to have 95% of the faculty having successfully completed at least two of these workshops by the end of the intersession in January, 1997, by the fall of 1996 to have 60% of the faculty utilizing technology in some form in their classes, and increase that amount to 90% by the fall of 1997.

The faculty workshops teach the "how to" of a particular piece of software or tool, but also incorporate strategies for implementing their use within the instructional programs of the University. The workshops included:

Enhancing the Presentation of Course Materials

Participants should come with an initial idea for incorporating presentations (PowerPoint) into the teaching methodology of at lest one specific course.

The workshop will cover PowerPoint's basic commands and tools. Discussions of utilizing visual images to organize and present ideas will serve as a stimulus for each participant to work on the design of one or more instructional units for a particular course. Participants will explore models on the use of presentations software for students as a tool or posing a question, and exploring the issues and organizing the results into a presentation.

Participants will:

a. implement their initial idea for using presentations by developing a prototype for use in a course, and
b. master basic PowerPoint commands and tools.

Dangling your Coursewares on the World Wide Web

Participants will learn how to develop their own home pages for a particular course or part of a course. Discussions will include home pages as: tools for helping students to frame a research question and present the results; pathfinders to navigate the myriad of resources on the Internet to explore a research question; an alternative to research papers

or publishing original work; and lecture and review tools.

Participants will:

a. identify one course for using home pages
b. develop a prototype home page for a course, and
c. master basic HTML commands

Enhancing Student Interaction through Electronic Dialog

A listprocessor has many potential educational uses for enhancing discussion and interaction in and between classes and different groups. It can even be a means for holding students accountable for course related discussions outside of the classroom as well as preparation for in-class activities.

This workshop will be comprised of two parts. The first half will cover the basic commands required to manage a listprocessor discussion list. The second part will consist of a discussion among the participants of the potential uses of listproc within their courses and will serve as the catalyst for each participant working on incorporating the use of a listproc discussion group in one or more courses to engage students actively in the exploration and organization of information as it relates to the content and/or assignments of that course.

Participants will:

a. master the basic listproc commands;
b. identify a course in which to use a discussion group, and
c. incorporate the use of a discussion group into the course syllabus.

Results of New Program

A survey of department chairs, conducted in early October, 1995, indicated that there were 31 faculty who had already integrated the use of technology into one or more of their courses for the fall, 1995 semester. Examples of what these faculty are doing include:

use of PowerPoint for class presentations, use of Intel Proshare for tutorials between main campus and branch centers, use of listproc for on-line discussion groups, use of the home page to present an interactive course syllabus, and Internet resources cited on course bibliographies as well as requiring their use in literature reviews by students.

Student response to the results of the use of technology will be integrated into the standard course evaluations. The results of a random survey of students in late October, 1995 are best captured by the following comment provided by a student on that survey:

"How exciting! Thanks for bringing Cyberspace into the classroom and modeling for us how we can make use of it. Your use of CLUnet made this class come alive."

Administrative Staff Training Program

Basic Skills

Because of the wide degree of skill level amongst staff relative to technology, much wider than the faculty, and because of the success of the faculty mentoring program, it was decided to utilize this approach with staff as well. However, we did not have enough staff to implement a mentor program across all departments. Hence, it was decided to take a slightly different approach from the faculty and cultivate one or more mentor/experts in each office. We are providing an intensive training for potential mentors during this fall semester. Our goal is to implement the mentoring program fully for staff during our intercession in January, 1996. Rather than ask for volunteers, each manager was asked to identify one or more staff (depending on the size of his/her department) who would serve as the mentor and become the resident expert for that office. As further inducement, staff who serve as mentors will be offered the ability to earn one additional floating holiday. In three of the larger offices we did not have enough individuals come forward so I went to the managers of those areas to discuss the situation. In two of the cases additional individuals were identified. In the third area, the manager felt that the one individual who had volunteered would be adequate. The purpose of the mentoring program will be to focus on the same three areas of basic competency as with the faculty. Netscape is included for staff because the University is moving in the direction of using its WWW Home Page as the gateway to information on and off-campus. Upon completion of the installation of the University's new administrative system, Netscape will be utilized by staff, faculty and students to query the administrative information system for data. Since implementation of this interface is about a year off, a fourth item was added to the staff list of competencies:

> knowledge of constructing basic queries in the University's new administrative information system.

Advanced Skills

The second tier of training for staff focuses on productivity tools that are available on the network. Inspired by success with faculty workshops which focused not only on the "how to," but also included the application of the "how to" to particular situations, the courses for staff on productivity tools employ examples from the CLU work place and invite attendees to think about how to use these tools to work smarter.

Under exploration via discussions currently at the President's Cabinet, is how ISS can team up with the various departments to focus on the impact of technology on processes and the need for process re-engineering. The conversations are centered on how mere utilization of technology may require changes in these processes as well as discussing how changes might be necessary to get the full benefit from technology. These conversations are particularly critical in light of the University's implementation of an entirely new administrative information system in all offices.

The ultimate success of our staff training efforts remains to be seen, but I am convinced that we can repeat our successes with the faculty in the staff training program because as collaboration

brought success in our faculty efforts, similar collaboration will lead to success amongst the staff. If these efforts were only those of ISS or some other department I would be less hopeful.

Conclusion

Collaboration and commitment have worked because they emanated from the top. The new training efforts and successes are due in part to the fact that such plans were discussed at the level of the President's cabinet which has helped insure sustained enthusiasm and support. Indeed the ISS team is not only surfing the net, but riding the crest of a most powerful wave, collaborative teaching and learning for more effective integration and use of technology. It continues to be an exhilarating experience, especially as our training programs continue to evolve and to weave their exponential effects.

The Risks of Success: Sustaining and Supporting Mainstream Use of Instructional Technology

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ABSTRACT

Much recent discussion has focused on the failure of instructional technology to move beyond the more technically inclined "early adopters" among the faculty and to engage the active involvement of mainstream teaching faculty. The support structures in place today seem more attuned to the early adopter population--both in types of support offered and the extent of support available--than to the interests and needs of the mainstream.

This paper will focus on three principal topics: strategies for engaging mainstream faculty in the effective use of information technology for instruction, the risks that success in this endeavor brings with it, and institutional strategies for supporting and sustaining mainstream involvement once it has been attained. Discussion will cover such topics as the real and perceived value of instructional technology, costs, infrastructure requirements, and scalability, along with examples drawn from experience at Stanford, UNC Chapel Hill, and other institutions.

Paper Not Available

The Leveraged Support Model- How to Support Work in a Distributed Computing Environment

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ABSTRACT

Computing support used to be so easy in the mainframe-only days. But with the arrival of microcomputers, desktop computing, client/server applications, and the Internet, support for users can no longer be effectively done by the computing center alone. As a result, a need for local support has emerged.

Indiana University has been working for over five years to establish, foster, educate, and coordinate a diverse and talented local support provider environment. It has established a partnership with the community of departmentally-based support staff who can help each other, and who rely on the central computing organization for education, certification, and support information and tools. It is now working on ways to empower the users themselves, to support their own use of computing technology by integrating problem management systems and knowledge bases via an easy- to-use Web client front-end.

Paper Not Available

Information Technology Planning: Letting the Users Take Over
A Federated Framework for Information Technology Planning[1]

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Abstract

The management of information resources at the University of North Texas campus is a shared responsibility between the schools and colleges and centralized service agencies, such as the Computer Center, the Library, and the Instructional Technology Center. Their roles, responsibilities, and services are coordinated through a representative university council: The Information Resources Council (IRC). The IRC is responsible for recommendations to the University's Vice Presidents and for participation in the university planning processes. The key to the success of this model is the cooperation and teamwork of all participants. Fundamental to the Council's organization is the role of the information technology user is the planning process. The Council is divided into program groups which have larger user components, and are often led by information technology users rather than information technology professionals. The UNT experience highlights how a user centered federated IT model can overcome traditional organizational barriers and boundaries, and be highly responsive to user needs.

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[1]This work was undertaken while the authors were at the University of North Texas.

Introduction

Colleges and universities are undergoing fundamental changes which will have direct impact on information technology services and structures. The demographics of higher education is changing with an increasing proportion of non-traditional learners entering university study. Expectations for services are rising, and students as well as faculty expect information and instruction on demand--any time and any place in a seamless information environment. The power of information, communication, and instructional technology is exploding and the focus of these technologies is converging.

Although this experience is common across universities, there are many models for service delivery to users. Because of various institutional histories and traditions, information technology organizations range from highly centralized to highly decentralized, and provide for user participation to varying degrees--active participation in management to cursory consultations. Each model has varying degrees of costs and effectiveness associated with it. Ideally each model should addresses the specific needs and environments of a local institutions in the most effective manner.

The management of information resources at the University of North Texas campus has evolved into a shared responsibility between the schools and colleges and centralized service agencies such as the computer center, library, and instructional technology center. Their roles, responsibilities, and services are coordinated through a representative university council: the Information Resources Council (IRC). The roles and responsibilities of the IRC have developed around two major features of the university: the concentration of information technology and the diversity of organizational structure.

The University of North Texas is a doctoral degree granting institution of 26,000 students located in the Dallas/Fort Worth area. Because of the need to keep staffing low at a state university, the university strategy was to trade people power for information technology power. Additionally, there was a strong commitment to the use and development of information technology in the research and teaching environment. According to some accounts, the University of North Texas had the highest per capita expenditure for information technology of any state assisted university in Texas. Needless to say, technology not only plays a strong role in the university but also represents a substantial investment. Unfortunately, while there was a clear vision to invest in technology, there was no consensus on how to managed this very sizable university investment.

As was common in many other universities, there was a dispersion of information technology organizations throughout the campus. Responsibility for information technology included centralized agencies such as the Computing Center, the University Library, the Center for Instructional Services, the Office of Telecommunications, and the specific computing and instructional technology organizations located in the university's eight schools and colleges. In addition, the university had a separate information technology structure at the Health Science Center in Fort Worth. The various information technology providers reported to different vice

presidents within the university. The Computing Center reported to the Vice President for Fiscal Affairs, while the Office of Telecommunications reported to the Vice President for Administrative Affairs. The remainder of technology providers reported to the Vice President for Academic Affairs and Provost.

History and development of the IRC and its user-centered program groups

The IRC developed out of a transformation of a computer advisory committee whose scope and mission was much more narrowly focused. Although this committee had a long history of providing user participation and guidance to the central computing organization, it often narrowly focused on issues of central computing versus decentralized computing and academic computing versus administrative computing–issues that by their nature created conflict and controversy. As the difference between these issues became more controversial and pronounced, it became clear that something needed to be done to refocus on the "bigger picture."

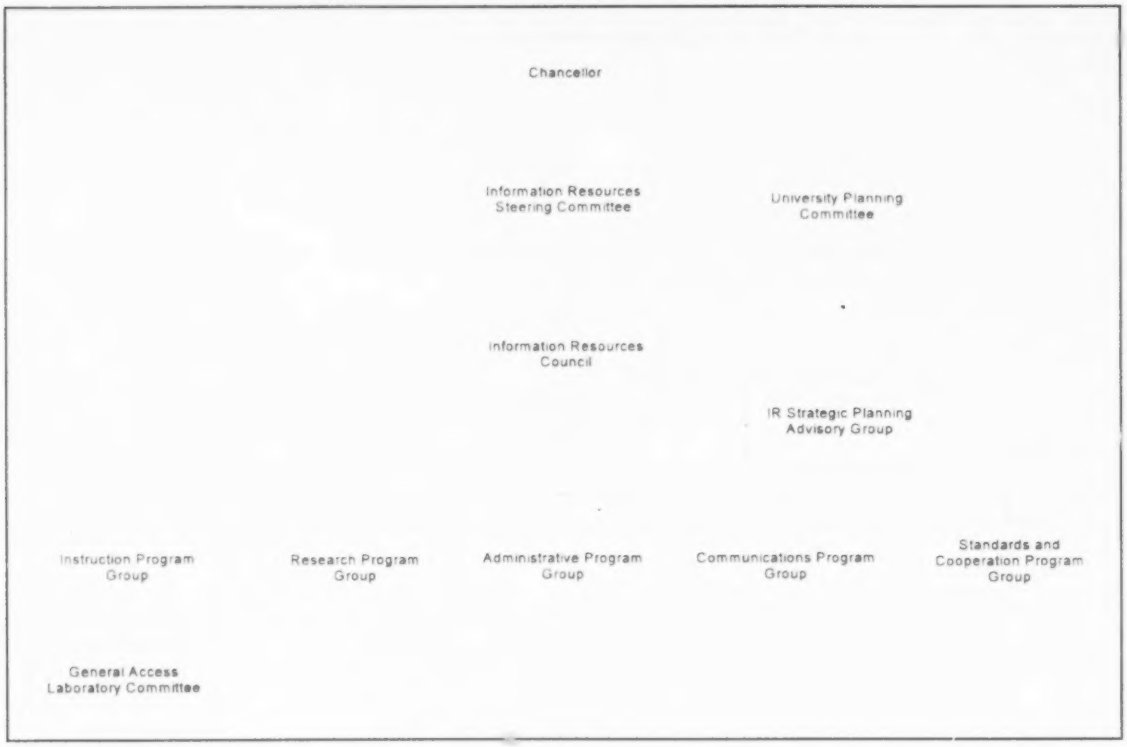
To initiate this redirection, the computer advisory committee was reconstituted as the Information Resources Council and its role expanded to address information resource and technology needs across agencies and media throughout the campus. The intent was to create an information technology organization that would:

1. Coordinate IT activities across the entire campus
2. Be responsive to the needs of all users
3. Provide a framework for planning for the future
4. Recommend resource allocations to central administration

As its purpose developed and was refined, the Information Resource Council became the sole organization on campus for recommendations to the university's vice presidents in the area of information technology and for participation in the university planning process. The cooperation and team work of all participants was key to the success of this model. Fundamental to achieving this spirit of cooperation was the restructuring of the Council to focus on broader issues and the expansion of the information technology user's role in the planning process.

The Council is divided into program groups which are composed largely of information technology users and are often led by users rather than information technology professionals. The Council's structure includes five program groups; each focused on broad areas of university concern–instruction, research, administrative systems, communication systems, and promotion of standards and cooperation. Each group reports directly the Council and elects its own chair. Members are appointed from the Council and from representative agencies such as the university's Faculty Senate. An overall Information Resources Strategic Planning Committee acts on behalf of the Council between regular meetings and approves all meeting agendas. Through its chair the Information Resource Council reports directly to a steering committee consisting of all university vice presidents. This steering committe is chaired by the provost.

University of North Texas Information Resources Council



Program groups are directly involved in the planning process and in some cases may also be asked to implement decisions. As stated earlier, because they were intended to be broadly based, program groups include a mix of providers and users, staff and faculty, centralized and de-centralized organizations. Each group participates in the development of its own structure. Program groups do not consist solely of IRC members, but users outside the IRC also are included to provide fresh insights.

A good example of diversity and projects addressed in the IRC is the Instructional Program Group. The goals and objectives of this group are to enhance teaching and learning through the use of information technology. Information technology includes such provisions as general access computing labs, computer enhanced video presentations, demonstrations, simulations, tutorials, video, distance learning, and access to libraries and knowledge bases. Using the instruction program group as an example, the following two cases illustrate how IRC program groups have created a more cooperative and effective approach to both the planning and management of information resources at the University of North Texas.

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Cooperative planning for technology

Before the creation of the Instructional Program Group (IPG), planning for instructional technology to support instruction was problematic. Responsibilities for supported instructional technology were fragmented across colleges, the Instructional Media Center, Library, and facilities planning department. Communication among these various groups was limited. Faculty and students often had no mechanism for voicing their needs. This problem became most evident when the University remodeled its six largest lecture halls.

The Office of Facilities Planning carried out the renovation of the lecture halls. While the university architect tried to involve the university community in planning this renovation, the fragmentation of constituencies and the lack of a ready forum made this difficult. As a result, an outside consultant was used who was more familiar with an industrial model of instruction rather than an academic model. Consequently the renovation failed to meet the needs of those that used the classroom and great deal of "finger pointing" followed.

When the Instruction Program Group was created, one of its first charges was to "fix" the problem of the newly renovated large lecture halls described above. Because of its broad-based membership, the IPG was able develop very quickly the necessary dialogue that was lacking when the renovation took place. It organized itself into various study groups to carefully examine the problem and to gain an understanding of all the issues. These groups conducted intensive group studies with the user community. All the various campus technical experts were brought together to examine ways to improve the classrooms based on specific suggestions gathered from the user community. Soon accusations and conflict gave way to constructive suggestions. While all the problems in the newly renovated lecture hall weren't resolved, people began to feel more positive about the way in which the problem had been addressed. The development of a rational process for planning and dealing with classroom technology made them feel that this kind of problem would be less likely to occur in the future. Faculty and other users of technology now believed that they had an effective mechanism for airing their concerns and effectively addressing their problems.

As a result of its initial experience with the renovation of large classrooms, the Instruction Program Group decided to develop a long range planning agenda to address the university's instructional technology needs. In 1994 the committee undertook a multifaceted review of instructional technology on the UNT campus. This included a physical inventory of all major classrooms on campus to determine what facilities were in fact available in every classroom and what areas needed improvement. In conjunction with this physical survey, instructors were also surveyed to determine their perceptions of teaching in the various classrooms and what shortcomings the various classroom might have from their perspective. The group also reviewed the volume and nature of faculty requests for both equipment and media programs. This was done to not only get a sense of the changing trends in equipment and program usage, but also to determine areas needing increased support.

The final component of this comprehensive review was a focus group study of faculty from across the university. This focus group study examined the issues related to instructional technology with a greater depth than is possible with simple paper and pencil surveys. Groups discussed the needs and barriers that prevented the optimal use of instructional technology in the classroom. They indicated concern about keeping pace with other institutions and more importantly indicated strong recognition of the benefits to the teaching process that technology can provide. Not surprisingly, faculty in these focus groups also expressed concerns about the large investment which can be required in the development and use of technology. Finally, a number of suggestions were made by the focus groups about how to facilitate the use of technology across campus but also cautioned the administration against seeing technology as primarily a cost-saving endeavor or as the answer to all instructional needs.

The focus group component of the review was important for two reasons. First, it provided the administration a very direct, rich source of information about faculty concerns and views concerning instructional technology in the classroom. Second, it gave faculty an opportunity to consider the issues important to them in an in depth manner as well as a chance to get those views broadly disseminated.

Besides this multi-faceted review, the Instructional Technology Program Group activities addressed a number other critical planing concerns. They developed comprehensive guidelines for minimum technology standards for all classroom environments. They also developed a proposal for funding campus-wide innovative technology programs. This program was endorsed by both the IRC and the university vice presidents and at the time of this writing is in the process of being implemented. The group also developed a plan for funding the systematic replacement of outdated media equipment, which is pending university approval.

While not all the problems planning and developing the technology resources to support instruction have been solved by the creation of this program group, a much more positive and cooperative environment has resulted. More importantly, given the freedom and autonomy to operate as team brought together for a specific purpose, this group has proven to be remarkably dedicated and productive. And, as the case below will show, this federated approach to empowering teams to address problems has even been successful in the actual management of technology facilities.

Cooperative management of information technology--General Access Labs

The general access computing labs at UNT are operated by individual schools and other service providers under the direction of the General Access Laboratory Committee, a sub-committee of the Instructional Program Group of the IRC. The General Access Laboratory Committee is unique in that it has direct control of an annual budget in excess of a million dollars. This budget is distributed to its constituent laboratories for campus-wide laboratory operations. The General Access Laboratory Committee assumed operations of these laboratories when the University introduced a campus-wide student computing fee. At the time the fee was

implemented it was originally thought that there would be a single laboratory, centrally administered by the university's computing center. Although some consideration was given to this model, it was clear the lab's need for new space might be insurmountable, and that there would be some duplication of lab activities already taking place in the schools and colleges. By creating a General Access Laboratory Committee with representation from each of the schools and colleges,the IRC was able to convince each of the school's deans to participate in a coordinated lab concept for the benefit of receiving central university support.

The first responsibility of the General Access Laboratory Committee was compiling standards across the university for lab administration. Sub-committees were formed to deal with issues ranging from equipment, service and software standards to security. Specific protocols were developed, as well as basic hardware and software configuration, hours of services, limitations of assistance, and related matters with the idea that a student could walk into any lab on the university and find a base line of common equipment, service, and software. Each individual school or college was also expected to emphasize both the software and services unique to its particular programs and missions. Thus, the laboratory in the College of Business Administration would have a larger group of business related software applications available, with lab monitors appropriate for its use while the College of Education would have greater concentration of equipment, software and services related to education and presentations.

The General Access Committee is an example where management of computing facilities is a shared responsibility between users and providers, and centralized and de-centralized organizations. The success of this model for coordinating diverse laboratories was successful as a result of leadership as well as the cooperation of its membership. The ability to share experiences among members, the efficiencies achieved by common practices, and the continued allocation of resources from the central administration acted as major incentives for this cooperation.

Other examples of cooperative efforts

The two examples above show how one program group, the Instruction Program Group, under the general umbrella of a university-wide council has been able to very effectively mount both a technology planning effort as well as take part in the management of technology resources. Other program groups have been able to achieve equally effective results. The Standards and Cooperation Group developed a proposal to equip all faculty and staff with at least a minimum base-line desktop computer. This proposal was approved, funded and scheduled to begin in the 1996. An even more dramatic example of the kind of cooperation that has developed out of the program groups is a recent joint proposal from the Research and Administrative Program Groups. Together they proposed the purchase of a new mainframe computer for administrative needs and additional centrally managed high-end computers to meet the needs of the research community. In the past, major computing upgrades had been contentious affairs–often creating a confrontation between academic and administrative interests. From the reports of those who had been involved in this process in the past, it was clear how well the groups had worked together to

build a common solution and how quickly the decision was able to be made and endorsed by the entire university community.

Summary of UNT experience: A "federated" approach

The University of North Texas Information Resource Council and its associated program groups provide a model for cooperative activity for both information technology providers and users. Its capacity for high participation within a decentralized environment, unification of purpose and strategic planning stems from both the effectiveness of its organization and the dedication of its individual members. With information technology formally organized across three vice presidential units, and with the traditional divisions between administration and academia and between faculty and staff, a union of these forces around a common objective within the Council and its program groups serves to provide both meaningful user input and effective planning and decision-making functions. While there are clearly inefficiencies in such a model of organization, these need to be weighed against the value of direct user guidance and campus-wide support.

Acknowledgment

The authors gratefully acknowledge the work and support of all the members of the University of North Texas community who were an integral part of the success of this federated approach to information technology planning.

(E)merging Environments and Professionals: The University Center as Catalyst for GMU's Vision

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Five years ago George Mason University began planning a new building and a technology infrastructure that would serve as a catalyst for changing the teaching/learning environment at GMU. With the fall1995 move into the new building, these changes continue to provide a catalyst for program development, and for the development of faculty and staff involved in its use. They also have led to new working relationships among faculty, librarians, and computing professionals.

George Mason's University Center is designed to be the crossroads of the University, occupying the physical center of the evolving campus and playing a central role in the transformation of the university's learning enviroment. When fully occupied the building's eight acres of floor space will weave together space for innovative academic programming, a technologically-advanced library, sophisticated computing facilities, instructional and social spaces, selected student services, and a variety of food services and shops. To support this unique combination of elements, many new infastructures are being created, including an advanced wiring network and new organizational partnerships.

George Mason University is a state-supported metropolitan university located next to the nation's capital. A young, vigorous institution building toward the future, George Mason's reputation for innovation results from its intent to be a world-class university committed to meeting the needs of a highly sophisticated Northern Virginia community, often characterized as a prototype of the high-tech, information/service- based economy of a post-industrial, knowledge-driven era. The university is exploring new approaches to a variety of needs: new curricula for undergraduates, new advanced degrees supportive of the Information Age, new openings on the cutting edge of telecommunications, new arrangements between the corporate world and higher education, and new cooperative arrangements with state government agencies and the private sector. Founded in 1957 as a branch of the University of Virginia, GMU now has an enrollment of 21,774 students and 742 full-time faculty in a wide array of undergraduate and graduate programs.

New Curriculum in the University Learning Center

John S. O'Connor

Background on New Century College:
New Century College offers a BA and BS in Integrative Studies. The key words for the program, the cornerstones to build on, are interdisciplinary, integrative, collaborative, experiential, technology rich, and competency-based. The curriculum is structured around learning communities, experiential learning, undergraduate research, and course offerings in the other academic units of the University. In the first year, students take one highly focused, interdisciplinary course at a time. They "learn to learn" by developing critical thinking skills, multiple perspectives, and reflective practice. Ideally, it is a small college within a large university, offering the intimacy of the one and the resources of the other. Examples and illustrations of the program may be presented, time permitting.

University Learning Center
The University Learning Center embodies the ideals of New century College, offering the intimacy and community of the place and the connections to tap the resources of the rest of the University and beyond. The new building enhances the possibilities of two of the cornerstones of the program: pervasive technology and collaborative work spaces. We have combined the Learning Community model with intensive use of information technology. We believe that the computer has become the premier technology tool that enables us to work more efficiently and effectively. But more importantly, it allows us to work both more collaboratively and more independently mastering material at one's own pace. Computer use pervades the curriculum and pedagogy of New Century; it is the ground we assume is there when we built the College.

Examples of current computer use.

The physical layout of space in the University Learning Center encourages groups to meet in lounges, around tables in the food court or library. Within the New Century College space is a study area, with handouts, magazines, videos, and various items related to th current courses. The hope is to encourage informal, out of class contact among students in a learning context. For easy computer access, ports and reservable ethernet cards allow network connections from many spaces in the building. There are computers for library and internet access at the information desk and in the library areas. There are computer labs, a multimedia authoring center, and a planned simulation studio. Descriptions of these three facilities may be in the other talks; particular use in New century will be detailed here.

For the program to succeed, we constantly depend upon the smooth operation of the infrastructure--the library and the technology--and upon the imagination of the students, faculty, and staff. The pervasive high tech and flexible, communal space are the enabling environment. The overlapping of professional roles is also matched with the greying of the line of who is teacher and who is learner. Students have been successful teachers in the Instructional Development Office. Similarly, they become the teachers in each of the key technology facilities in the University Learning Center.

University Center Library
Charlene S. Hurt

The design of the University Center Library began with a charge from the President of GMU to "think about a library in a student union. At that time Fenwick Library was the only library facility on campus, and suffered from severe overcrowding of stacks and seating and badly out-of-date wiring and networking. Around the same time a select faculty committee on the future of libraries was meeting, and its final report emphasized three primary needs:

a. creation of a research library to support growing graduate programs
b. creation of a "teaching library" to help students achieve information literacy
c. use of technology to achieve excellence, rather than relying on development of a paper collection

Around the same time the university was engaged in rethinking the undergraduate curriculum, and librarians participated in teams working to design a new interdisciplinary, multicultural core. As part of that process, librarian held a retreat focused on our concerns that the needs of undergraduate students were being neglected in the push to support graduate-level research. Perhaps the most useful aspect of the retreat was a discussion of our individual memories of that moment when learning was most exhilarating - and the realization that those moments almost never took place in a library, almost always were in a collaborative environment, and frequently involved food and/or drink.

The process of planning a library in a student union, therefore, began with a desire to create a new kind of learning environment for undergraduates (and, coincidentally, free up the current environment for a more classical research library approach) and an interest in supporting new ways of teaching undergraduates that depended on collaborative learning, extensive use of media and technology, and an awareness of the growing diversity on our campus. So we proposed a "teaching library" that would have a paper collection supporting the undergraduate core but would also hold the entire media collection and, through its technology, have extensive access to materials in electronic format (there weren't many available then, but we were optimistic about the growth of electronic publishing). We also proposed a Student Authoring Center where students could incorporate media into their papers and presentations and a Media Distribution Center for distribution of media throughout the building and, potentially, the entire campus.

I need for a moment to describe the massive scale of this building in comparison to other buildings on campus - it is triple the usual size of construction project funded by the Commonwealth, with 8 acres of floor space, and it stands on the highest and most central point of the new campus growth, about one block from Fenwick Library. The size and location alone enable it to be central to the campus; our goal was to cluster activities in it that would assure that centrality, in order to give a "commuter campus" a heart. Fortunately for us, the University's President believed that a library should be at the heart of a university. The first transition we had to make was to believe that a library could be successfully located in the midst of food and commercial space and student service activities.

The big breakthrough in the design of the building occurred when the two major occupants

of the building - the library and bookstore - agreed to develop vertically, so that a lively atrium could be created for food services and shops. The next breakthrough was when the library agreed to treat its book collection as an "open collection," shelved along the eastern sides of the upper two floors and not separated from the rest of the building. Suddenly we had an "agora," or, as some of our less reverent librarians say, a shopping mall.

During the development of the building plans four groups of players who barely knew each other participated in several joint planning sessions: library staff, computer services staff, student union staff, auxiliary services staff. Each planning team also had student and faculty representatives. One thing I learned is how dedicated staff from these areas are to serving students, and how often they share a common sense of not being heard or appreciated (the Rodney Dangerfield syndrome). We found we were natural allies on many subjects.

The University Center Library today encompasses four major areas:

An extensive multimedia collection with appropriate equipment and a multimedia service desk for assistance in using any "machine-using" collection, including online reserves
and full-text periodicals

A teaching/extended reference area for drop-in and scheduled instruction in various information sources and extended assistance in research. This includes a fully-wired interactive classroom seating forty at networked workstations.

A collection of books focusing on undergraduate learning and intentionally multicultural in content, interspersed with a variety of seating.

An Information Desk which is jointly managed with University Information Services and which provides information about the library, the building, and the university as a whole via a series of networked terminals and a University Center Home Page.

The library has a "controlled section" where media, reserves, periodicals, and reference books are shelved and where the primary service desks are located. All the seating in this area is wired and networked, and there are 56 "superterminal" workstations with high end networked computers and printers. Special facilities for disabled patrons and group viewing facilities are also available in this space. The "open library" contains sufficient shelving for 100,000 paper volumes and approximately 1000 library seats, 60% of which are wired for power and network connection. There are 32 small group study rooms, also fully wired. Distinctive carrels provide computer workstations, but the space is primarily designed for students bringing in their own laptops; networking cards will be checked out from technology services.

Over the years the University Center has evolved our working relationships have also undergone a transition, so that we now are working very intensively with University Computing, especially their Telecommunications group, and with Information Services. We continue to work with Student and Auxiliary Services, and have added the Center for the Arts for programming display and performance space. We expect these relationships to grow now that we're actively occupying the building. Perhaps most significant is our

new partnerships with faculty, especially with New Century College, and our evolving role as part of the team of mentors students rely on as they work their way through college. Adjacent to the library is the Multimedia Authoring Center, about which Randy Gable will tell you more.

Infrastructure Support

Walter W. Sevon Jr.

The University Learning Center telecommunications infrastructure was designed to complement the work being done on the campus through the Communications Infrastructure Project. To understand and fully appreciate the University Learning Center infrastructure one must understand what George Mason University has done through the Communications Infrastructure Project.

Through the Communications Infrastructure Project the university is installing:

• A complete **underground conduit system**, with manholes, encased in concrete, that connect all 107 buildings on the Fairfax Campus. The system is sized to allow future growth and support GMU for 20 years.
Statistics: 7.1 Miles of concrete encased conduit; 24 total miles of Conduit; 47 Manholes.

• An **interbuilding cabling system,** connecting all 107 buildings on the Fairfax Campus with fiber optic cabling, copper cabling, and coax cabling to support all data, voice, and CATV requirements at the Fairfax Campus. This cabling will be installed in the underground conduit system.
Statistics: 588 Miles fiber; 30,000 copper pairs installed.

• **An intrabuilding cabling system** consisting of rewiring 90% of Fairfax Campus buildings with fiber optic cable and high capacity copper cabling (Unshielded Twisted Pair (UTP)) that will support the new voice system and current and future high speed data requirements.
Statistics: 2,400,000 feet of the highest quality UTP.

• A new **high speed data network** backbone (interbuilding data network) and wiring concentrators (intrabuilding data network) for all GMU locations. A high speed Pilot Multimedia Network (ATM) connected to the data network backbone and the new Interactive Electronic Classroom. Our new data backbone can carry 40 times more data than today and improved service will be provided to all computer labs and all other network users. Students will now have data connectivity to the mainframe and access to the Internet from their residence.

• A **Video Distribution system** that will distribute 30 CATV entertainment channels and 10 additional GMU channels to all residence halls and all buildings on the Fairfax Campus. It will be possible to film a class/performance in any building and to broadcast it over the CATV network.

• An **Electronic Classroom/Distance Learning System** that includes 2 electronic classrooms at the Fairfax Campus and distance learning classrooms at the Fairfax and Prince William Campuses. Professors will be able to prepare multimedia presentations for their classes that can be delivered to the Electronic Classrooms over the CATV network, the Pilot Multimedia Network, or the data network.

• A new **voice system** that includes telephone systems (PBXs) at the Fairfax Campus, Arlington Campus, Prince William Campus, Commerce I & II, the Mathy house, and the

Center for Professional Development; links these PBXs together; and gives a single system image. The system includes over 3200 digital & analog telephone sets and also supports Integrated Services Digital Network (ISDN) capability. This system replaces the Rolm and Centrex service and will provide improved service levels at reduced cost to GMU.

• A new **management system** that will control the voice/data/CATV systems that will be based from a new Network Control Center located in Thompson Hall. This system will allow GMU personnel to rapidly reconfigure voice and data networks and give immediate support to students, faculty, and staff.

University Learning Center Infrastructure

The above is a good description of what the Communications Infrastructure Project will provide the university. The University Learning Center is an extremely large building and has a robust telecommunications infrastructure of its own which consists of the following:

• 740,000' of Category 5 UTP cable encompassing 4139 data/telephone outlets. The outlets are distributed throughout the center with a large percentage of the outlets located in public areas. 8.35 miles of installed fiber optic cable distributed to every Telecommunications Closet in the building.

• A high speed data network consisting of 880 Ethernet 10BaseT Ports and 48 10/100 MBs ports. The 10/100 MBs ports are used to segment the network and to support servers and other high performance workstations. 406 of the 880 Ethernet 10BaseT Ports are dedicated to the library, with most of the ports dedicated to public access terminals and positions within the library where students can bring their laptop computer and access the network. Additionally, ports are provided for public access in the coffee house and other public areas.

• The headend of the Video Distribution System is located in the center. There are 62 coaxial connections that can carry the GMU/CATV channels and they are distributed throughout the center in assembly/classrooms, meeting rooms, library video carrels, media viewing rooms, commercial spaces, and public lounges. The facility will allow assembly/classrooms in the center and classrooms throughout the campus to schedule and control VCRs, laserdisk, CD-ROM, betacam, audio cassette, and CD-Interactive sources. It is located adjacent to the library in order to have immediate access to the library media collections that can be scheduled to play at scheduled times on assigned GMU channels.

• A computer lab with 54 90 MHz Pentium computers, 25 PowerMac 6100/66 computers, and 2 handicap workstations. The computers will all have Internet access as well as access to a dedicated high performance server.

• A pool of laptop adapters that can be checked out to faculty or students when they bring in their personal laptop computers.

Media Authoring Center (MAC) - The MAC will provide an access facility with equipment, software and expertise to assist students and faculty in the preparation of media and multimedia based projects. The MAC will closely collaborate with the Instructional

Development Office and New Century College to ensure a comprehensive and consistent program of new media services for the campus. The MAC will have a video production studio, video editing stations, an audio recording booth, a sound editing station, and 5 multimedia equipped computer workstations (PowerMac 8100AV). The latter will have access to input from VCR, videodisk, CD-ROM, flatbed and slide scanning, and common audio sources. The emphasis will be on providing a migration path for the GMU community to move from analog presentations to full digital multimedia equipment.

The Faculty Development Perspectiye

Professor Michael R. Gabel

What Faculty Development is Becoming

What Comes First: The Technological Chicken or the Egg or the ???

Student Development: Literacy - Motivation - Expectation
Technology Development: Networks - Labs - Electronic Presentation/Interactive Classrooms
Faculty Development: Curriculum modification/enhancement - Culture change - Support

Faculty Development: A High Priority

George Mason University decided that Faculty Development was a high priority, and as a result, many faculty are both willing and able to incorporate into their teaching the resources of the Technologically Enhanced University Learning Center

The Process: Curriculum modification/enhancement

Early 1980's: The PAGE Program was inaugurated. This two-year Plan for Alternative General Education incorporated programmable calculators and e-mail on a Cyber mainframe. New interdisciplinary courses were created by the faculty for this program.

Mid 1980's: Computers and Writing. Sections of English 101 were revised to take advantage of technology

1994: New Century College (discussed earlier)

The Process: Culture change - Support: The Instructional Development Office (IDO)

Conceived by President George Johnson's "Project Team on Learning Initiatives," the Instructional Development Office (IDO) was established in the Spring of 1991 and is charged with bringing information technology to bear on the educational mission of the University.

The IDO is a faculty support facility, managed by faculty, serving the entire GMU academic community.

The IDO:

- •provides support for faculty in:
  - °designing courseware
  - °using the technology-enhanced classrooms
  - °applying computer-based communications to extend classroom discussion
- •manages a training/production computer/multimedia laboratory
- •teaches workshops in the latest tools for the application of technology to teaching
- •organizes discussion seminars on pedagogical and policy issues related to technology integration
- •tests and then recommends hardware and software solutions to the problems of creating and delivering technology-based learning environments
- •provides a range of video and graphics support: from basic editing and scanning to video production and computer animations
- •seeks partnerships with outside corporations and agencies which enable the production and dissemination of technology-based learning environments
- •contributes (via presentations, workshops, and demonstrations) to the ongoing national dialogue on the role and future of technology in teaching

Key Accomplishments:

- •Established a responsive, competent, well-funded facility which encourages and supports faculty to integrate technology into their teaching (established in Spring 1991)
- •Designed and managed the installation of four high-end technology-enhanced classrooms (1992)
- •Received a Virginia State Council of Higher Education Grant: "Infusing Technology into Teaching, Learning, and Community" ($115,000, 1994-96)
- •Instituted the "Showcase for Technology in Innovative Teaching" (1991, 1993, spring 1996 [planned for the University Center opening])
- •Organized Intensive Faculty Development Workshops:
  - °Early Adopters (25 participants, summer 1992)
  - °Summer 1993 at the IDO (110 faculty participants in study/development groups)
  - °Distance Learning Workshop (30 participants, summer 1994, supported by Bell Atlantic)
- •Taught workshops for faculty on teaching and technology (207 registrations this year alone)
- •Provided a focal point for innovative teaching for our faculty and visitors to the GMU campus

- ***How the IDO is getting ready for the University Learning Center***

Showcase for Technology in Innovative Teaching:

For the Opening Ceremonies (Spring 1996), the IDO will organize a showcase where faculty will demonstrate their use of technology in their teaching.

Technology Learning Competition (TLC):

The IDO has been involved in helping organize the TLC, for which teams of Faculty/Staff/Students/Community Members will create interdisciplinary projects designed to foster a sense of community involvement and to demonstrate GMU's links to local businesses, institutions, and agencies. Although this is an opening day event, it is expected that it will be continued each year.

Faculty Orientation Presentation: "The Student Paper of the Future"

We provided demonstrations to faculty of the kind of research paper (multimedia enhanced) that students will now be able to submit: created in the University Center Student Authoring Facility and submitted via the campus network.

The Web

We have been teaching a number of workshops for faculty on Web Publishing. We have also provided enhanced support to certain faculty who have been incorporating the Web into their teaching, with particular attention to faculty asking students to publish class projects on the Web.

In Short

The IDO is helping faculty to get ready to expect changes in both their students and in the University, changes that reflect the possibilities that the new technologies bring to teaching.

How The Future of Faculty Development Depends on

The UC Library + The Center Activities + The Infrastructure

Student Support/Help Facility

Finally, located in the University Center, there will be a technology support facility for students. Faculty have been hampered in their efforts to encourage students to apply technology to their learning, for to do so often required the use of valuable "class time." The IDO should now, finally, be able to say: "If you create it (or incorporate it), your students will be able to use it."

Raising Expectations of Faculty: The Network

"Don't Worry. – – As soon as the network is finished....." Faculty have been hearing this for quite a while. We are all wondering if the use and capabilities will be in synch. For example, as faculty hear that video will be distributed from the University Center Media Distribution Facility, they want it on their desktops, on their students' home computers, and in the classrooms where they teach. One of the deterrents to IDO's helping faculty to create and incorporate new digital materials has been that it was not so clear where the data would be stored and if the bandwidth of the network was sufficiently high to deliver reliably such materials. The new network is supposed to resolve this problem.

Raising Expectations of Faculty: The Data

What will we put on this new network? The range expected is from "not much more than we already do" to "everything." Faculty may expect that much of the Library resources will be digitized, if not momentarily then very soon. In addition, faculty will expect that the UC Library increase its purchases of digitally stored materials and that the Librarians work with faculty to created an innovative digital library.

Faculty-Student Teams: Creating New Teaching Materials

Currently, the IDO has been supporting faculty in the modest production of new teaching materials. Faculty have discovered that this process takes considerable time. Even more important, some have come to realize that the better model for these activities relies on the use of faculty/student teams. The new Student Authoring Facility will be the training grounds of those students who will eventually join such teams.

Student-Centered Learning

Many faculty are eager to create environments in which students take more responsibility for their own learning. That the new University Center is being called a Learning Center (rather than a Student Union) reflects this desire. Such a change requires efforts on both the faculty and the students. It is the faculty anticipation that the University Center, with its Undergraduate Library, its emphasis on Technology, its numerous breakout and study facilities, and, yes, its bistro, will indeed become such a facility.